SWINE HOUSING LAYOUTS

Alberta
AGRICULTURE

Agdex 721-5

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Prepared by: Engineering Branch of Alberta Agriculture

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INTRODUCTION

A hog barn represents a major capital investment for a farming operation. Before starting construction a set of blueprints should be obtained. Time spent in researching and establishing specifications for your swine barn will avoid costly mistakes. Changes in a blueprint can be made easily, quickly and at little cost, but changes made during construction are costly and time consuming. This handbook summarizes what Alberta Agriculture can offer swine producers. It deals with the basic layout of the buildings and equipment necessary for a profitable swine business.

As you consider alternatives, allow for:
Regulations, which may dictate or limit building location and waste disposal.
Expansion, perhaps to twice the production you are now planning.
Your neighbors, who may object to noise, odor and dust from your operation.
Building cost,worksheets are provided at the back of this handbook for you to use.

Regulations

Regulations of a number of agencies will affect the establishment of your hog operation. A building permit is required from your county or municipality for construction of your barn. Permits for electrical wiring, gas, or oil burner installation, plumbing and sewage disposal are also required. Board of health regulations will also apply.

Certificate of Compliance

Certificate of Compliance is a voluntary program administered by Alberta Agriculture in cooperation with the Alberta Environment. A certificate can be issued to a livestock operation which meets all applicable regulations and is in production. A decision report may be issued prior to construction of a new livestock operation. Both the Certificate of Compliance and the decision report may have conditions attached to them.

Obtaining a Certificate of Compliance is intended to give the farmer some degree of protection should a dispute arise regarding pollution, provided the operation and level of management are similar to those at the time the certificate was granted.

Several agencies are involved in evaluating a Certificate of Compliance application. Any or all of the following may be involved:

- Local government
- Regional Planning Commission
- Alberta Transportation
- Local Board of Health
- Alberta Environment
- Department of Labour
- Alberta Agriculture

Building Construction and Plans

Before construction be sure to have a written contract with the construction company erecting your building. Read the contract carefully and suggest changes if the terms are not suitable.

A detailed blueprint is a valuable asset, and can be referred to in a contract.

The layouts in this publication are for discussion purposes only. Obtain a **BLUEPRINT** before commencing construction.

Plans and planning assistance for your hog barn are available from your regional agricultural engineer.

FARROW-TO-WEAN

LAYOUT

Layout A101 shows a 45 - 56 sow farrow-to-wean barn complete with dry sow housing

The barn is divided into a farrowing area, a weaner area, gestation area and an entrance-utility area. Separate rooms allow the operator to maintain suitable environments for each class of livestock.

Barn layout allows for convenient expansion and/or the addition of a feeder barn.

Manure is handled as a liquid. Underslat gutters are used to collect manure, which can then be transported to long term storage outside the barn.

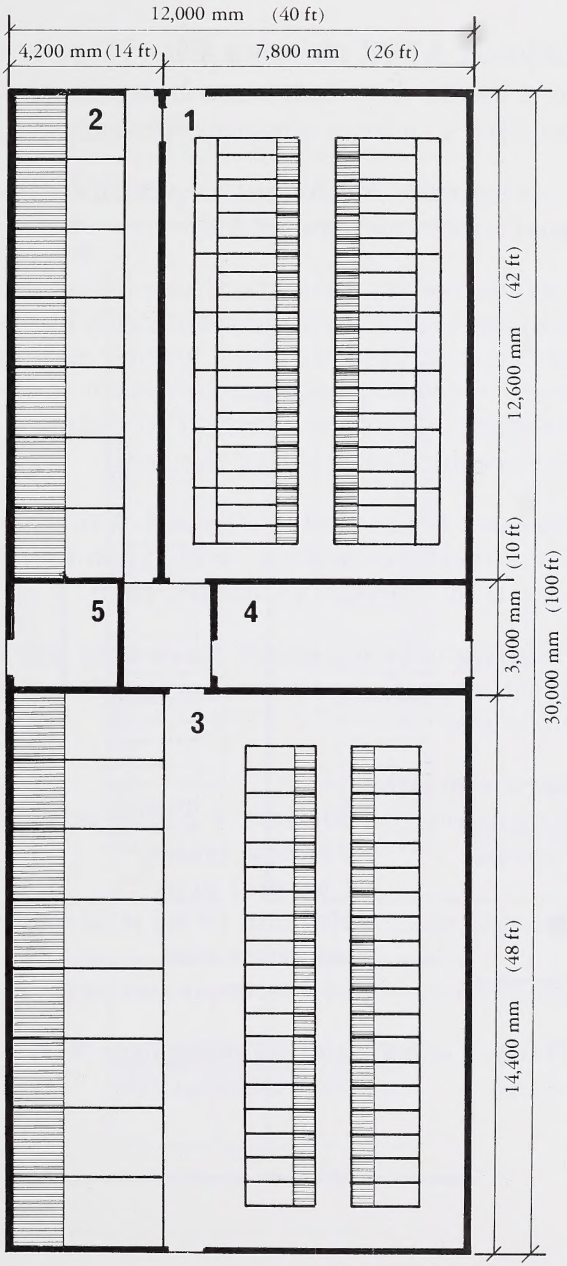
Heating is by hot water space heat and ventilation is by a negative pressure system using exhaust fans and baffled air inlets.

Barn statistics

dimensions:	12,000 mm x 30,000 mm (40 ft x 100 ft)
capacity:	14 farrowing crates
	7 weaner pens
	38 dry sow stalls
	8 sow or boar pens
construction:	2400 mm (8 ft) stud walls
	truss rafter roof
Production:	800 weaners per year

Plans: Construction drawings are **NOT** available for this layout.

... 45 - 56 SOW



1. Farrowing Room
2. Weaner Room
3. Dry Sow or Gestation Room
4. Utility/Office Room
5. Furnace Room

LAYOUT A101

FARROW-TO-WEAN

LAYOUT

Layout A102 shows a 60 - 70 sow farrow-to-wean hog barn. Dry sows are housed in outdoor facilities or in a separate gestation barn.

This layout is not readily expandable, however, a finisher barn could easily be added.

Two farrowing rooms facilitate all-in all-out farrowing, a management technique which aids in disease control. An entrance-utility area and a weaner room complete the barn. Providing separate rooms for farrowing and weaning allows the operator to maintain separate environments in each of the areas.

Manure is handled as a liquid. Underslat gutters are used to collect manure, which can then be transported to long term storage outside the barn.

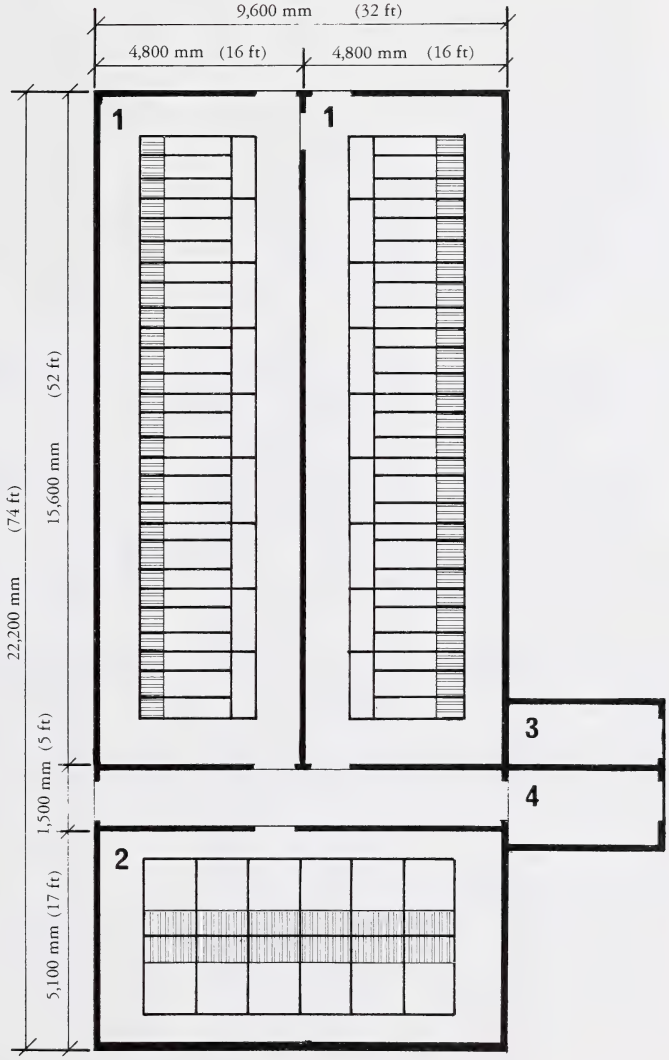
Heating is by hot water space heat and ventilation is by a negative pressure system using exhaust fans and baffled air inlets.

Barn statistics

dimensions:	9600 mm x 22200 mm (32 ft x 74 ft)
capacity:	18 farrow crates
	12 weaner pens
construction:	2400 mm (8 ft) stud walls
	truss rafter roof
production:	1040 weaners per year

Plans: Construction drawings are **NOT** available for this layout.

... 60-70 SOW



1. Farrowing Room
2. Weaner Room
3. Boiler Room
4. Utility Office Room

LAYOUT A102

FARROW-TO-WEAN

Layout A103 shows a multiple room farrow-to-wean barn.

This barn is readily expandable by the addition of farrowing and weaner rooms.

This barn has individual farrowing and weaner rooms opening into a central hallway. The number of farrowing crates per room can be increased or decreased to suit the needs of the individual operator. Multiple roomed farrowing and weaner facilities allow all-in all-out management which aids in disease control.

Manure is handled as a liquid. Underslat gutters are used to collect manure, which can then be transported to long term storage outside the barn.

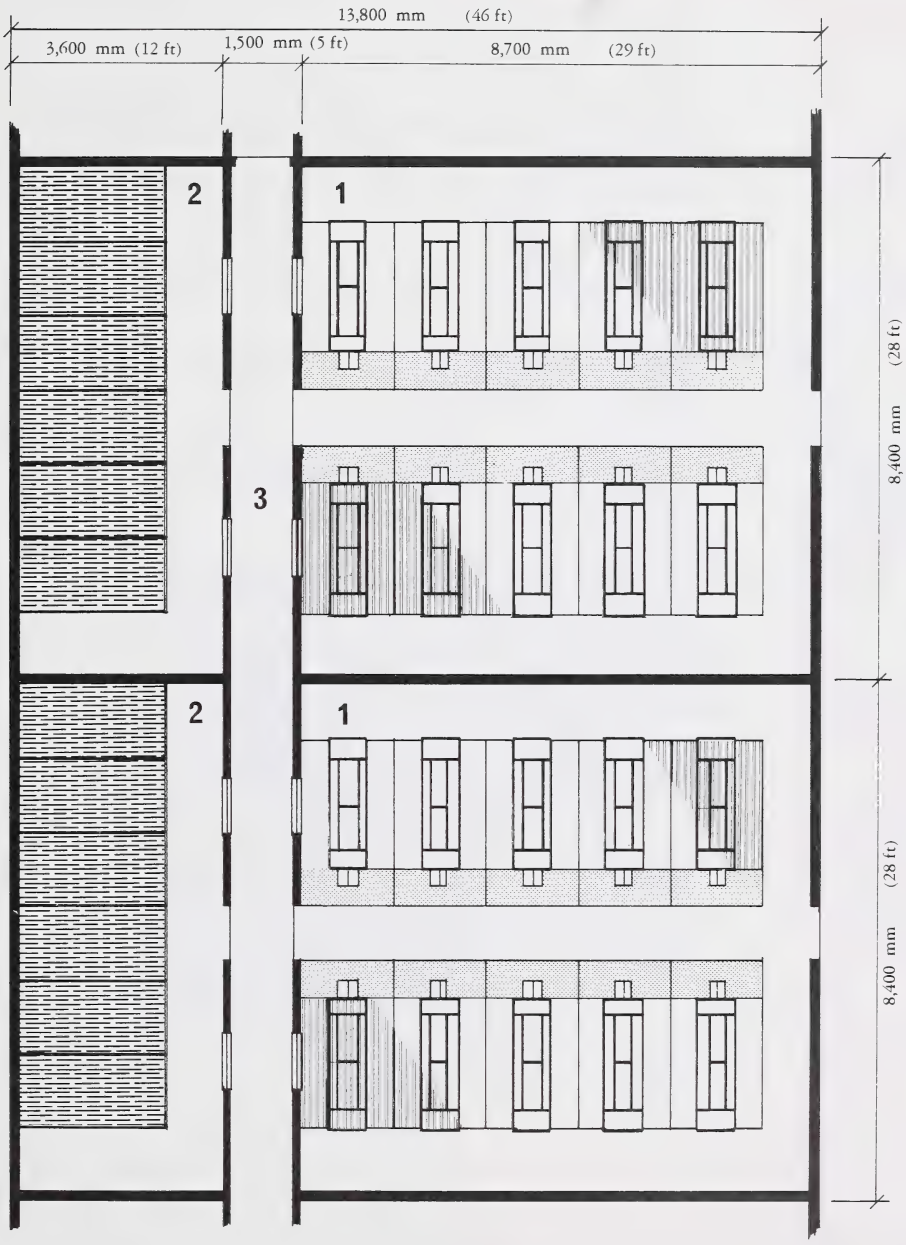
Heating is by hot water space heat and ventilation is by a negative pressure system using exhaust fans and baffled air inlets. The hallway is used to preheat and temper ventilation air.

Barn statistics

dimensions:	13800 mm x multiples of 8400 mm (46 ft x 28 ft)
capacity:	6, 8, 10, 12 farrow crates per room 6 weaner pens per room
construction:	2400 (8 ft) stud walls truss rafter roof

Plans: Construction drawings available. Ask for plan A3333.

... MULTIPLE ROOM



1. Farrowing Room
2. Weaner Room
3. Hallway

LAYOUT A103

FARROW-TO-FINISH

Layout A201 shows a small 12-16 sow farrow-to-finish barn.

This layout is suitable for the hobbyist or for the producer who wishes to supplement his income with a small scale hog operation. Dry sows are housed either outside or in other facilities.

This layout does not have expansion potential.

This layout features raised farrowing crates and weaner decks and 3 pens for feeder hogs.

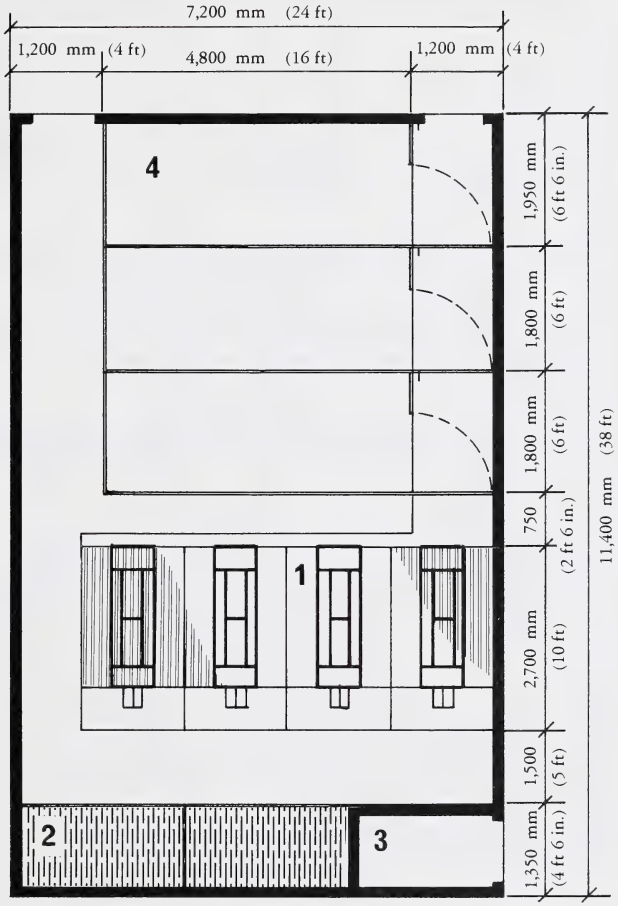
Manure is removed from the barn using a manual scrape system. This will allow the operator to use straw bedding.

Heating is by hot water space heat and ventilation by a negative pressure system using exhaust fans and a baffled air inlet.

Barn statistics

dimensions:	7200 mm x 11400 mm (24 ft x 38 ft)
capacity:	4 farrowing crates
	3 finishing pens
	2 weaner decks
construction:	2400 mm (8 ft) stud walls
	truss rafter roof
production:	125 finished pigs
	125 weaners per year

Plans: Construction drawing are **NOT** available for this layout.



1. Farrowing Room
2. Weaner Room
3. Boiler Room
4. Finishing Room

LAYOUT A201

FARROW-TO-FINISH

Layout A202 shows a 24-32 sow farrow-to-wean hog barn. Dry sows are housed in separate facilities.

This is a labour intensive barn with limited expansion potential.

The barn has a farrow-wean section, a feeder section and an entrance utility area.

Manure is removed from the barn daily by a manual scrape system. Alternative manure handling systems include underslat gutters and transport to long term storage and flush manure systems.

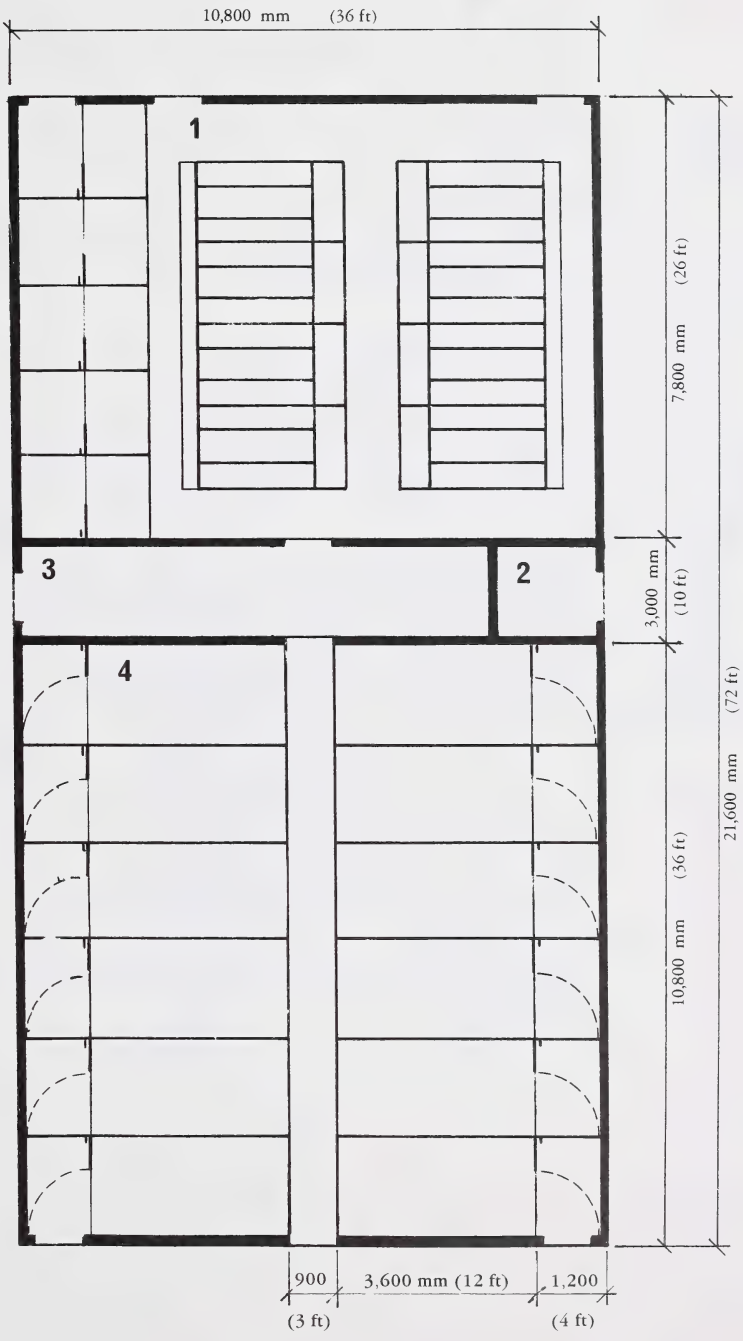
Heating is by hot water space heat and ventilation is by a negative pressure system using exhaust fans and baffled inlets.

Barn statistics

dimensions:	10800 mm x 21600 mm (36 ft x 72 ft)
capacity:	8 farrowing crates
	5 weaner pens
	12 grower-finisher pens
construction:	2400 mm (8 ft) stud walls
	truss rafter roof
production:	480 finished hogs per year

Plans: Construction drawings available. Ask for plan A3055.

... 24-32 SOW



1. Farrowing Room
2. Boiler Room
3. Utility/Office Room
4. Finishing Room

LAYOUT A202

FARROW-TO-FINISH

Layout A203 shows a 30-40 sow farrow-to-finish barn complete with dry sow housing.

Barn layout allows for convenient expansion.

The barn has an H shaped layout and is divided into farrowing, weaner, feeder and dry sow rooms. Separate rooms allow the operator to maintain a suitable environment for each class of livestock.

Manure is collected in underslat gutters and transported to long term storage outside the barn.

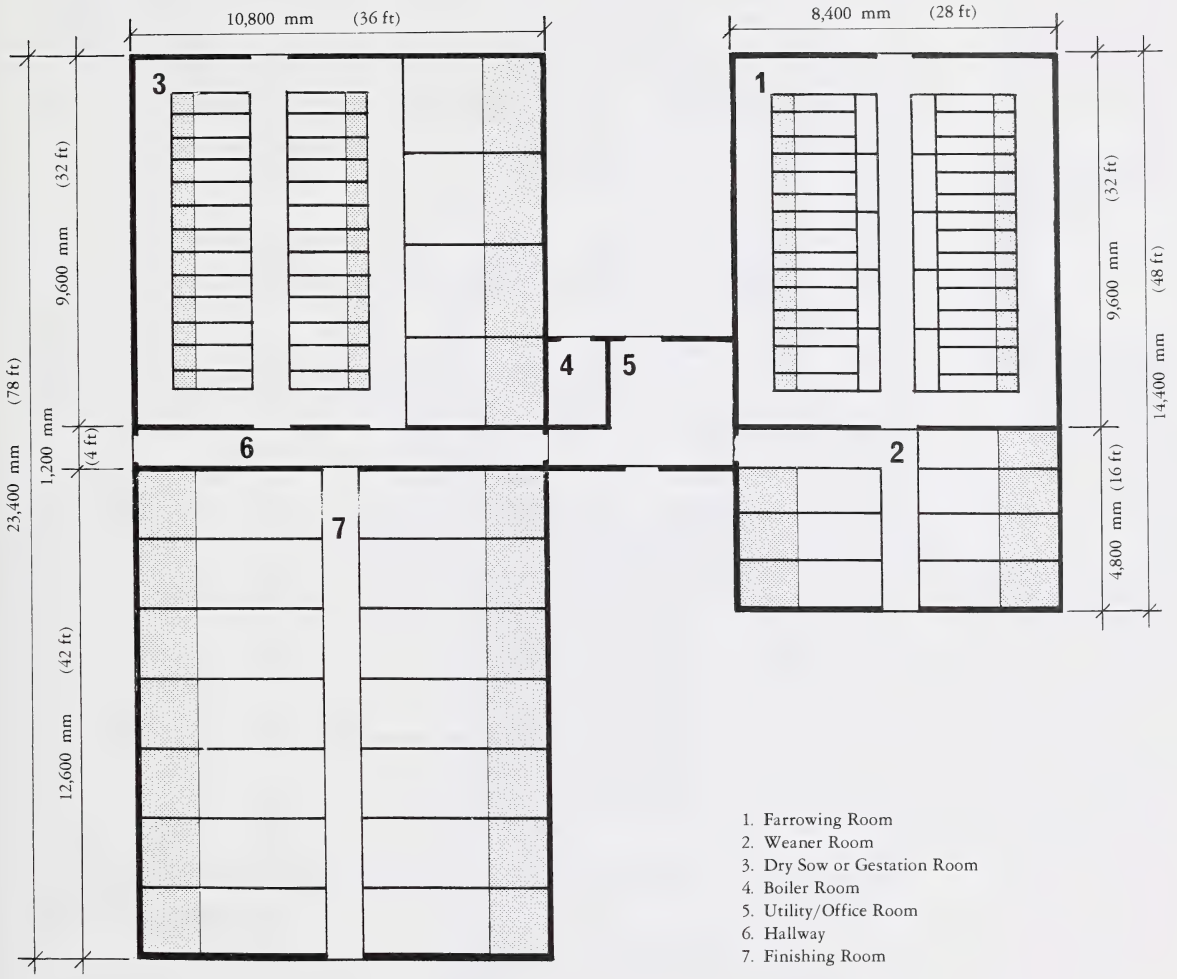
Heating is by hot water space heat and ventilation is by a negative pressure system using exhaust fans and baffled air inlets.

Barn statistics

dimensions:	10800 mm x 23400 mm (36 ft x 78 ft)
	8400 x 14400 mm (28 ft x 48 ft)
capacity:	10 farrowing crates
	7 weaner pens
	14 finisher pens
	26 dry sow stalls
	4 dry sow pens
construction:	2400 mm (8 ft) stud walls
	truss rafter roof
production:	560 finished pigs per year

Plans: Construction drawings are **NOT** available for this layout.

... 30-40 SOW



1. Farrowing Room
2. Weaner Room
3. Dry Sow or Gestation Room
4. Boiler Room
5. Utility/Office Room
6. Hallway
7. Finishing Room

LAYOUT A203

FARROW-TO-FINISH

Layout A204 shows a 30-40 sow farrow-to-finish hog barn with dry sow housing.

This barn layout has limited expansion opportunities.

The barn is divided into farrowing, weaner, feeder and dry sow areas and an entrance utility area. Separate rooms allow the operator to maintain a suitable environment for each class of livestock.

Manure is handled as a liquid. Underslat gutters are used to collect manure. It is then transported to long term outside storage.

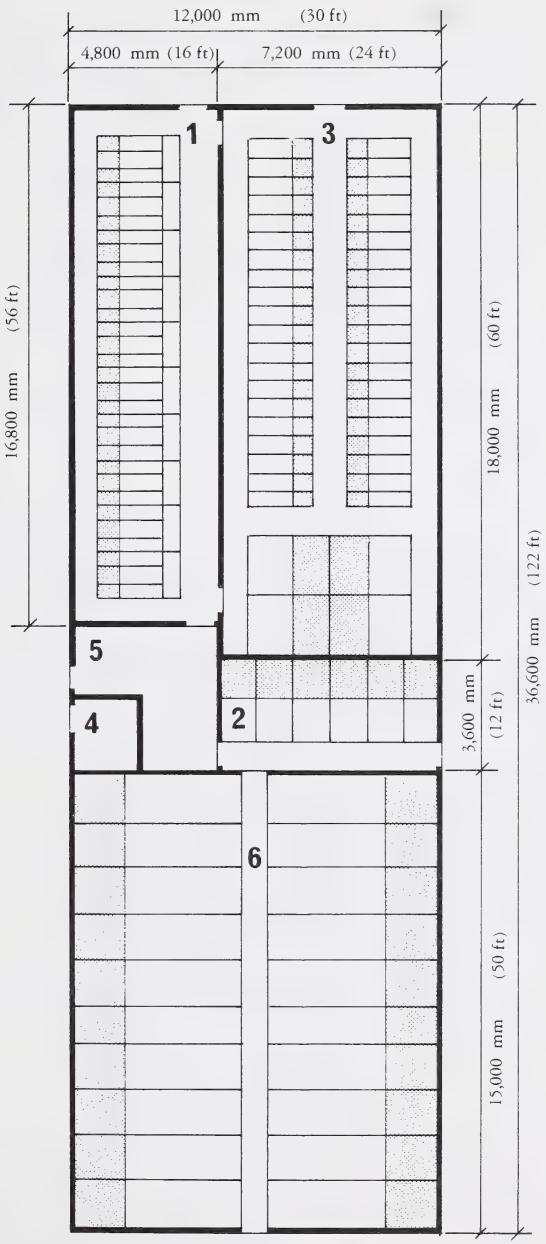
Heating is by hot water space heat and ventilation is by a negative pressure system using baffled air inlets and exhaust fans.

Barn statistics

dimensions:	12000 mm x 36600 mm (40 ft x 122 ft)
capacity:	10 farrowing crates
	6 weaner pens
	40 dry sow stalls
	4 dry sow pens
	20 feeder pens
construction:	2400 mm (8 ft) stud walls
	truss rafter roof
production:	560 feeder pigs per year

Plans: Construction drawings are **NOT** available for this layout.

... 30-40 SOW



1. Farrowing Room
2. Weaner Room
3. Dry Sow or Gestation Room
4. Boiler Room
5. Utility/Office Room
6. Finishing Room

LAYOUT A204

FARROW-TO-FINISH

Layout A205 shows a 50-60 sow farrow-to-finish hog barn. Dry sows can be housed in separate facilities or in an optional gestation barn.

Barn layout allows for limited expansion.

The barn has two farrowing rooms, two weaner rooms, a feeder room and an entrance utility area. Multiple room farrowing and weaner areas allow for all-in all-out management, and better disease control.

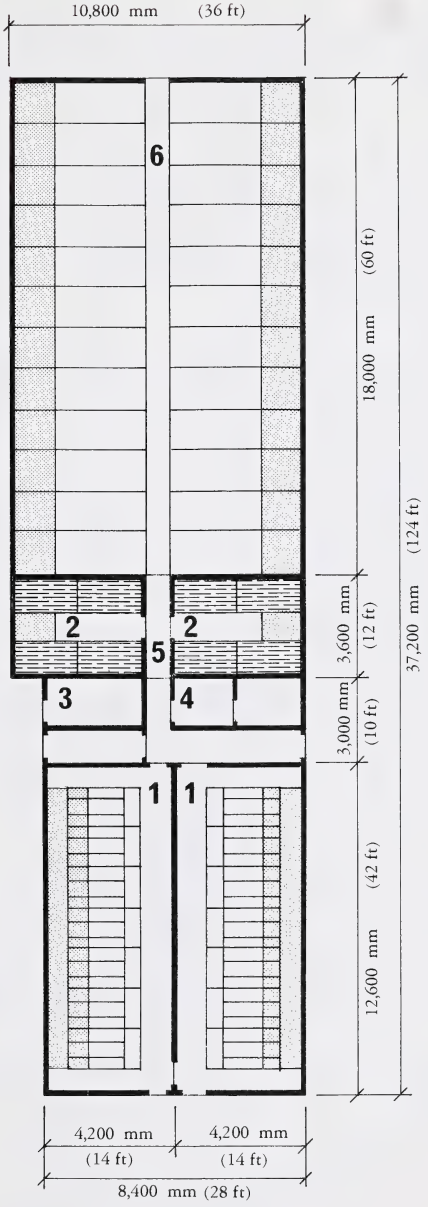
Manure is handled as a liquid. Underslat gutters are used to collect manure. It is then transported to long term outdoor storage.

Heating is by hot water space heat and ventilation is by a negative pressure system using baffled air inlets and exhaust fans.

Barn statistics

dimensions:	10800 mm x 21600 mm (36 ft x 72 ft)
	8400 mm x 15600 mm (28 ft x 52 ft)
capacity:	14 farrowing crates
	8 weaner decks
	24 finishing pens
construction:	2400 (8 ft) stud walls
	truss rafter roof
production:	880 feeder pigs per year

Plans: Construction drawings available. Ask for plan A3056.



1. Farrowing Room
2. Weaner Room
3. Boiler Room
4. Utility/Office Room
5. Hallway
6. Finishing Room

LAYOUT A205

FARROW-TO-FINISH

Layout A206 shows a 50-60 sow farrow-to-finish hog barn without dry sow housing.

This layout has limited expansion potential.

This barn has four distinct areas, farrowing, weaner, feeder and utility. Separate areas allow the operator to maintain suitable environments for each class of livestock.

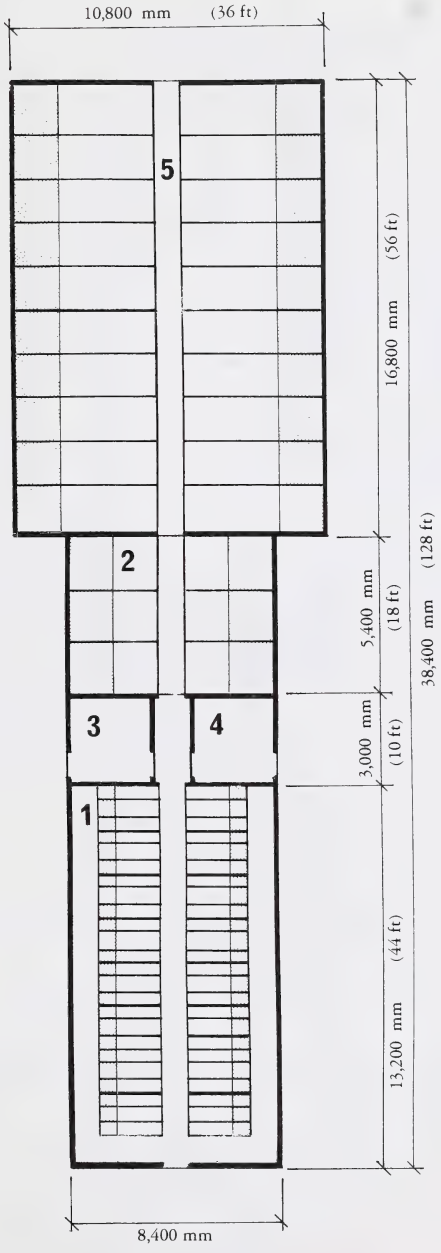
Manure is handled as a liquid. Underslat gutters are used for collection and manure is transported to long term outside storage.

Heating is by hot water space heat and ventilation is by a negative pressure system utilizing baffled air inlets and exhaust fans.

Barn statistics

dimensions:	10800 mm x 16800 mm (36 ft x 56 ft) feeder barn 8400 mm x 21600 mm (28 ft x 72 ft) farrow-wean
capacity:	16 farrowing crates 6 weaner pens 20 finisher pens
construction:	2400 mm (8 ft) stud walls truss rafter roof
production:	240 weaners per year 720 finishers per year

Plans: Construction drawings are **NOT** available for this layout.



1. Farrowing Room
2. Weaner Room
3. Boiler Room
4. Utility/Office Room
5. Finishing Room

LAYOUT A206

FARROW-TO-FINISH

Layout A207 shows a 45-55 sow farrow-to-finish hog barn complete with dry sow housing.

This barn layout offers limited expansion possibilities.

Features of this layout include two farrowing rooms, dry sow area, utility entrance, two weaner rooms and a finishing barn. Multiple farrowing and weaner rooms allow for all-in all-out management and aid in disease control. Separate rooms allow the operator to maintain suitable environments for each class of livestock.

Manure is handled as a liquid. Underslat gutters are used to collect manure, which is then transported to long term outdoor storage.

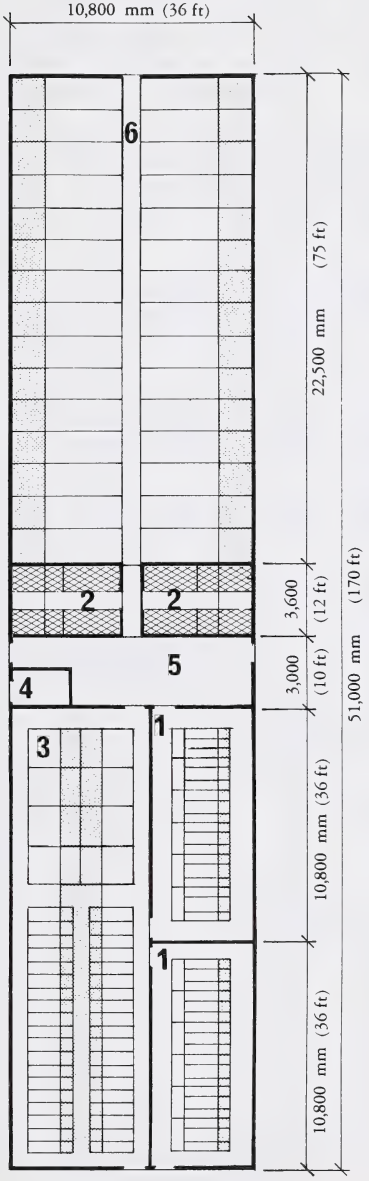
Heating is by hot water space heat and ventilation is by a negative pressure system consisting of baffled air inlets and exhaust fans.

Barn statistic

dimensions:	51000 mm x 10800 mm (170 ft x 36 ft)
capacity:	12 farrowing crates
	8 weaner decks
	30 feeder pens
	38 dry sow stalls
	8 dry sow pens
construction:	2400 mm (8 ft) stud walls
	truss rafter roof
production:	800 feeders per year

Plans: Construction drawings are **NOT** available for this layout.

... 45-55 SOW



1. Farrowing Room
2. Weaner Room
3. Dry Sow or Gestation Room
4. Boiler Room
5. Utility/Office Room
6. Finishing Room

LAYOUT A207

FARROW-TO-FINISH

Layout A208 shows a 60-75 sow farrow-to-finish hog barn, with outdoor dry sow housing.

This barn layout allows for limited expansion.

The barn has two farrowing rooms, two weaner rooms, a feeder room and an office utility area. Separate farrowing and weaner rooms allow all-in all-out management.

Manure is handled as a liquid. Underslat gutters are used to collect the manure which can then be transported to long term outside storage.

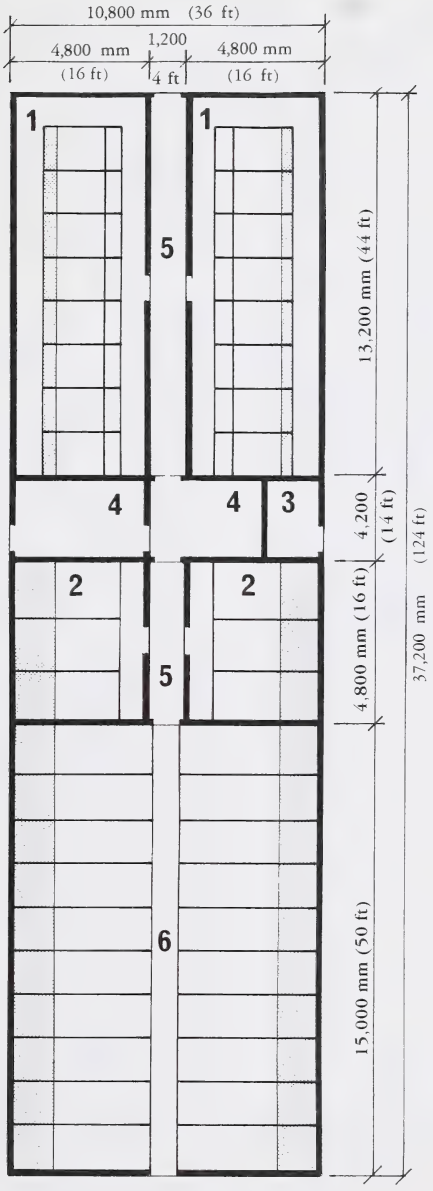
Heating is by hot water space heat and ventilation is by a negative pressure system using exhaust fans and a baffled air inlet. Hallways in the farrowing-weaner areas can be used to preheat incoming ventilation air.

Barn statistic

dimensions:	10800 mm x 37200 mm (36 ft x 124 ft)
capacity:	16 farrowing crates
	6 weaner pens
	20 feeder pens
construction:	2400 mm (8 ft) stud walls
	truss rafter roof
capacity:	700 finisher pigs per year
	340 weaners per year

Plans: Construction drawings are **NOT** available for this layout.

... 60-75 SOW



1. Farrowing Room
2. Weaner Room
3. Boiler Room
4. Utility/Office Room
5. Hallway
6. Finishing Room

LAYOUT A208

FARROW-TO-FINISH

Layout A209 shows a 60-75 sow farrow-to-finish hog barn complete with dry sow housing. Dry sows are housed in individual stalls.

This barn layout allows for convenient expansion.

The barn has four farrowing rooms, weaner area, dry sow area, grower finisher area and a utility area.

Manure is handled as a liquid. Underslat gutters are used to collect the manure which can then be transported to long term outside storage.

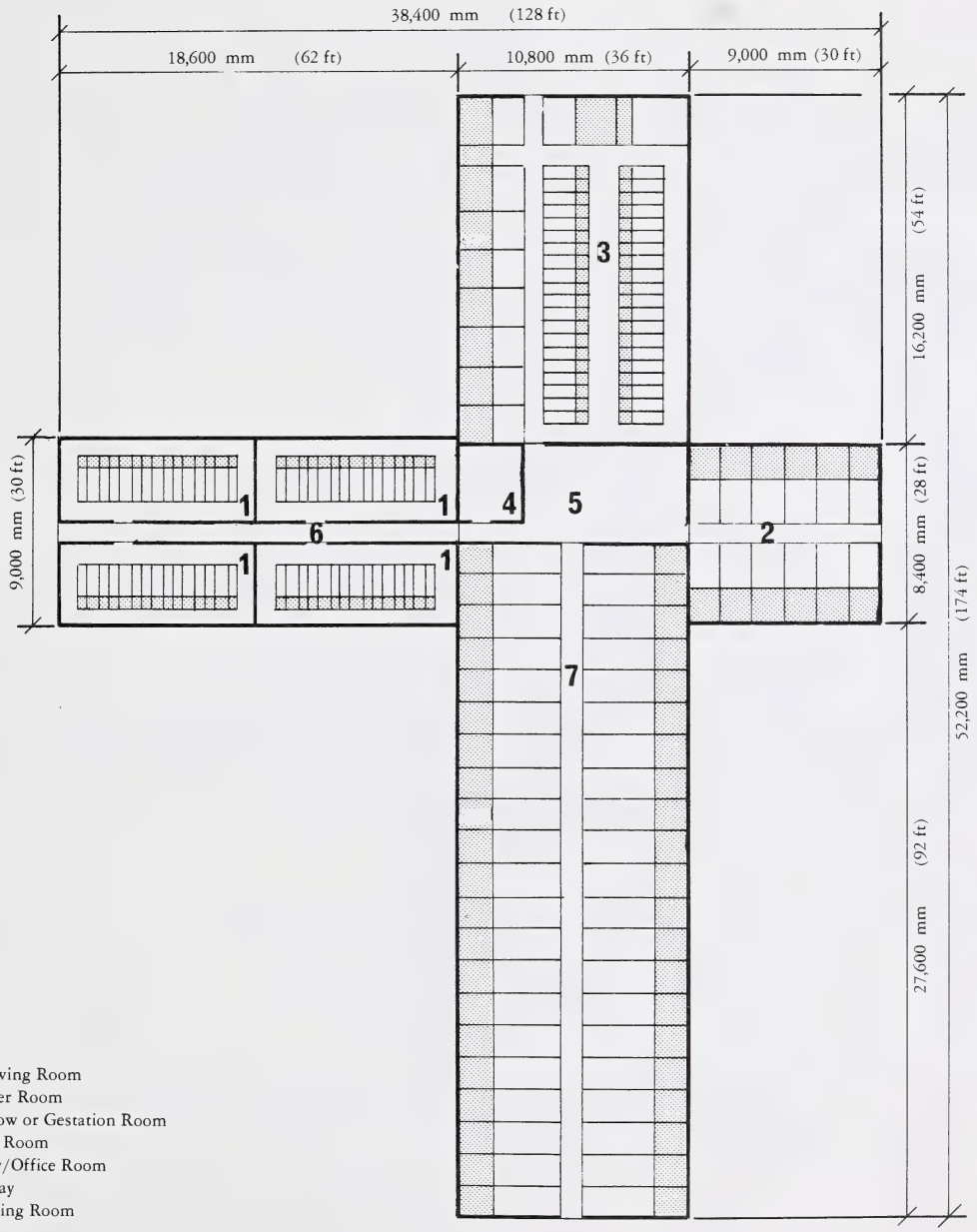
Heating is by hot water space heat and ventilation is by a negative pressure system using exhaust fans and baffled air inlets. The hallway in the farrowing area can be used to preheat incoming air.

Barn statistics

dimensions:	4 wings; 9000 mm x 18600 mm (30 ft x 62 ft) 10800 mm x 16200 mm (36 ft x 54 ft) 9000 mm x 8400 mm (30 ft x 28 ft) 10800 mm x 27600 mm (36 ft x 92 ft)
capacity:	20 farrow crates 40 dry sow stalls 10 dry sow & breeding pens 12 weaner pens 42 finished pens
construction:	2400 mm (8 ft) stud walls truss rafter roof
production:	1200 finished pigs per year

Plans: Construction drawings are **NOT** available for this layout.

... 60-75 SOW



1. Farrowing Room
2. Weaner Room
3. Dry Sow or Gestation Room
4. Boiler Room
5. Utility/Office Room
6. Hallway
7. Finishing Room

LAYOUT A209

FARROW-TO-FINISH

Layout A210 shows a 90-100 sow farrow-to-finish hog barn with dry sow housing. Dry sows are housed in group pens.

This barn layout allows for convenient expansion.

The barn has four farrowing rooms, a dry sow area, two weaner rooms, a feeder barn and an office utility area. Separate rooms allow the operation to have all-in all-out farrowing and to maintain suitable environment for each class of livestock in the building.

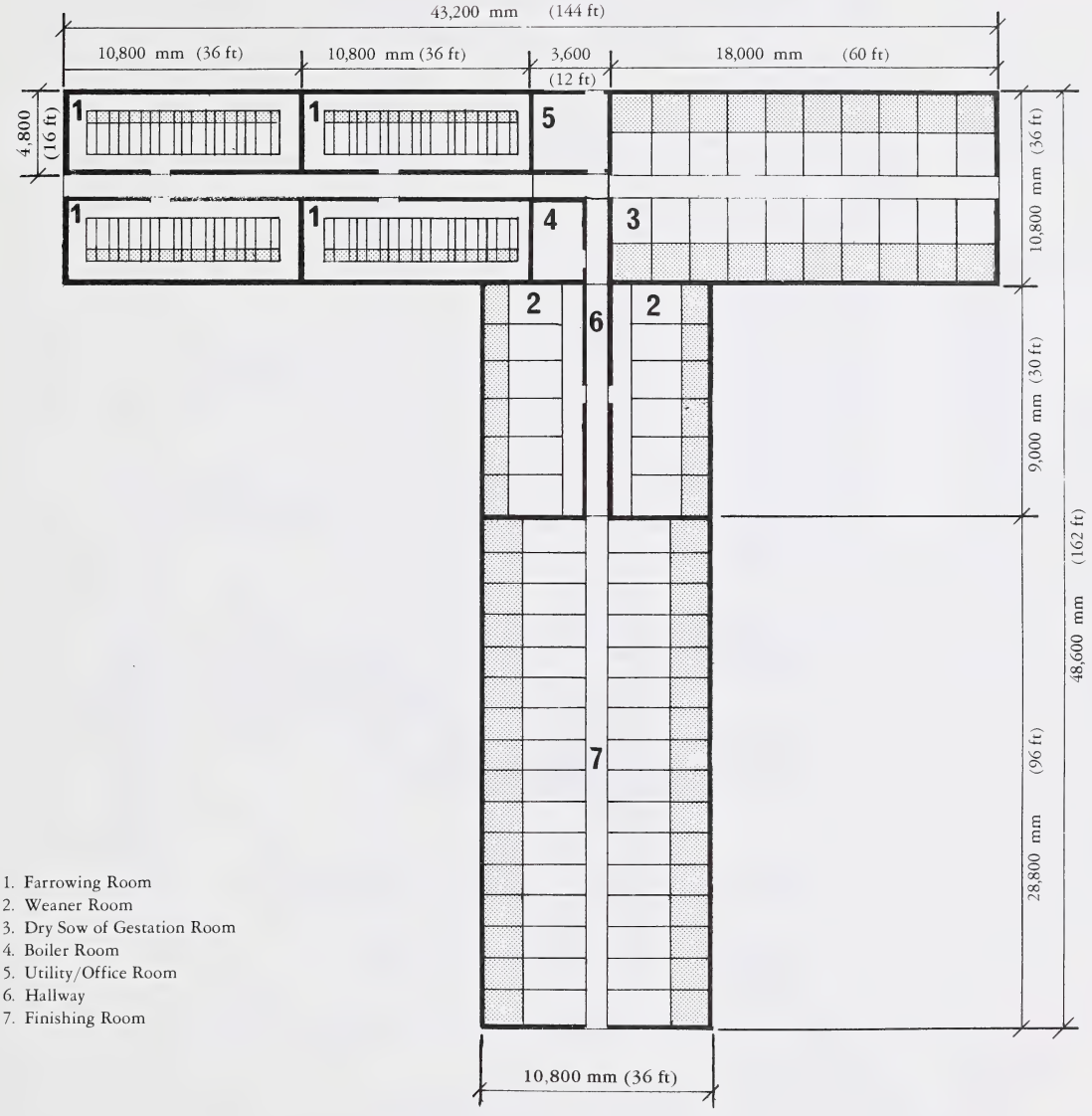
Manure is handled as a liquid. Collection is by underslat gutters. Long term outdoor storage can be used with this manure system.

Heating is by hot water space heat and ventilation is by a negative pressure system utilizing exhaust fans and baffled air inlets.

Barn statistics

dimensions:	10800 mm x 43200 mm (36 ft x 144 ft)
	10800 mm x 37800 mm (36 ft x 126 ft)
capacity:	24 farrowing crates
	20 dry sow pens
	12 weaner pens
	32 finisher pens
construction:	2400 mm (8 ft) stud walls
	truss rafter roof
capacity:	1200 finished hogs/year
	400 weaners/year

Plans: Construction drawings are **NOT** available for this layout.



1. Farrowing Room
2. Weaner Room
3. Dry Sow of Gestation Room
4. Boiler Room
5. Utility/Office Room
6. Hallway
7. Finishing Room

LAYOUT A210

FARROW-TO-FINISH

Layout A211 shows an H shaped farrow-to-finish barn for 100 sows, complete with dry sow housing.

This barn layout allows for convenient expansion and efficient work patterns.

The barn is divided into two farrowing rooms, dry sow area, weaner area, a grower-finisher barn and an office utility area.

Manure is handled as a liquid. Underslat gutters are used to collect manure, which can then be transported to long term storage outside the barn.

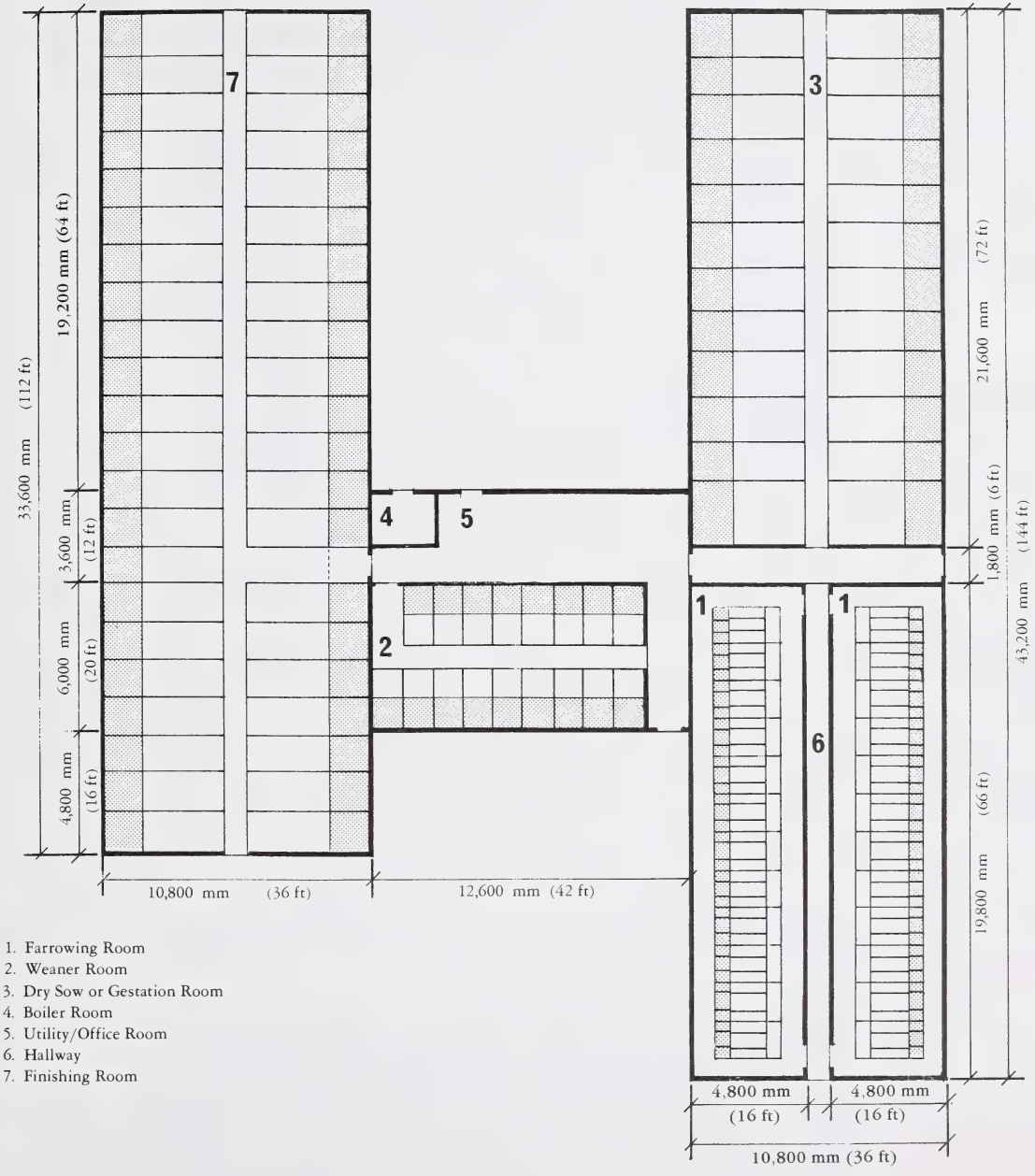
Heating is by hot water space heat and ventilation is by a negative pressure system utilizing exhaust fans and baffled air inlets.

Barn statistics

dimensions:	10800 mm x 43200 mm (36 ft x 144 ft)
	10800 mm x 33600 mm (36 ft x 112 ft)
	12600 mm x 9600 mm (42 ft x 32 ft)
capacity:	24 farrow crates
	24 dry sow stalls
	17 weaner pens
	41 feeder pens
construction:	2400 mm (8 ft) stud walls
	truss rafter roof
production:	1600 feeders per year

Plans: Construction drawings are **NOT** available for this layout.

... 90-100 SOW



1. Farrowing Room
2. Weaner Room
3. Dry Sow or Gestation Room
4. Boiler Room
5. Utility/Office Room
6. Hallway
7. Finishing Room

LAYOUT A211

DRY SOW HOUSING

Layout A301 shows a 10800 mm (36 ft) wide dry sow housing. This barn uses group pens 1500 x 4800 mm (5 ft x 16 ft) in size, and is readily expandable.

Manure is handled as a liquid. It is collected in underslat gutters and can then be transported to long term outdoor storage.

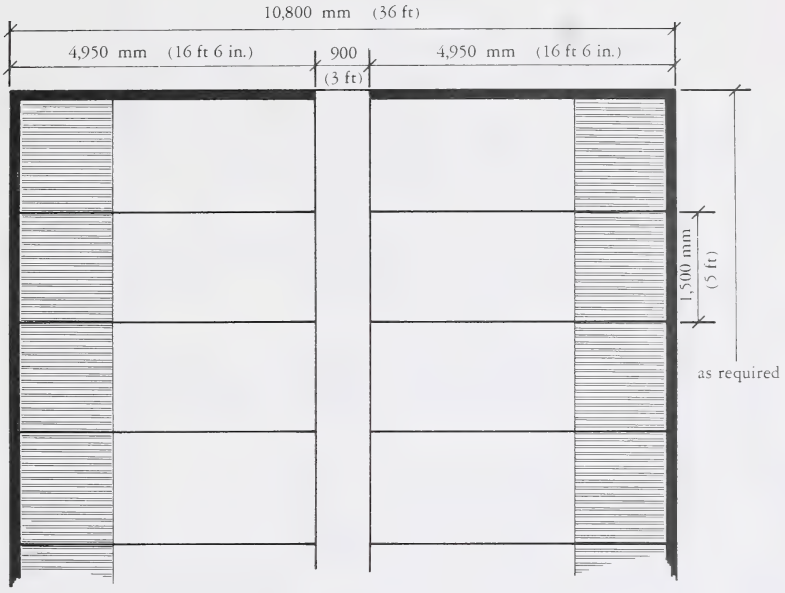
Heating is by hot water space heat and ventilation can be by negative pressure, positive pressure or natural ventilation.

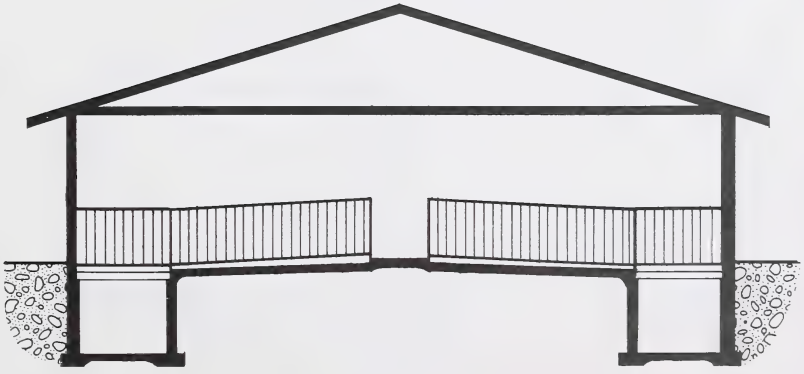
Barn statistics

dimensions: width 10800 mm (36 ft)
length as required to suit herd
construction: 2400 mm (8 ft) stud walls
truss rafter roof

Plans: Construction drawings available. Ask for plan 3428.

... GROUP PENS





LAYOUT A301

DRY SOW HOUSING

Layout A302 shows a 10800 mm (36 ft) wide dry sow barn. This barn uses individual dry sow stalls and breeding pens. This barn is best suited to sow herds of 100 or less.

Manure is handled as a liquid. It is collected in underslat gutters and can be transported to long term outdoor storage.

Heating is by hot water space heat and ventilation can be by negative pressure system, positive pressure or natural ventilation.

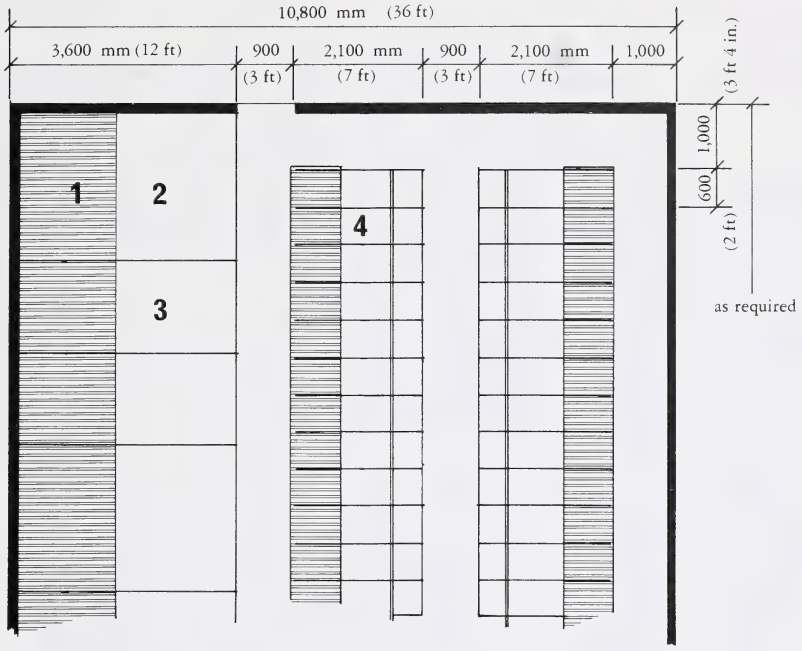
Barn statistics

dimensions: width 10800 mm (36 ft)
length as required

construction: 2400 mm (8 ft) stud walls
truss rafter roof

Plans: Construction drawings available. Ask for plan 3236.

... INDIVIDUAL PENS



1. Breeding Pen
2. Boar Pen
3. Sow and/or Gilt Pen
4. Individual Stalls

LAYOUT A302

DRY SOW HOUSING

Layout A303 shows a 12600 mm (42 ft) wide dry sow barn. This barn uses individual dry sow stalls and breeding pens.

Manure is handled as a liquid. It is collected in underslat gutters and may be transported to long term outdoor manure storage.

Heating is by hot water space heat system and ventilation is by a negative pressure ventilation system utilizing exhaust fans and a baffled inlet.

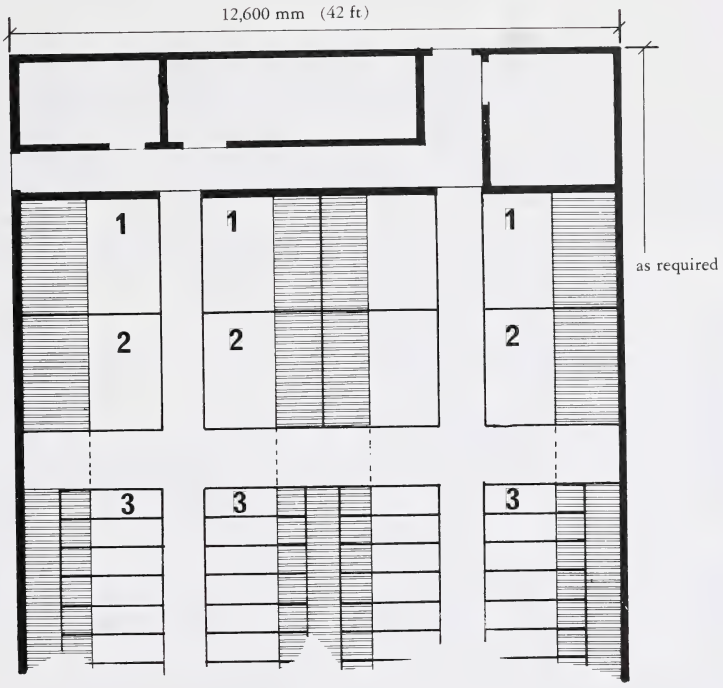
Barn statistics

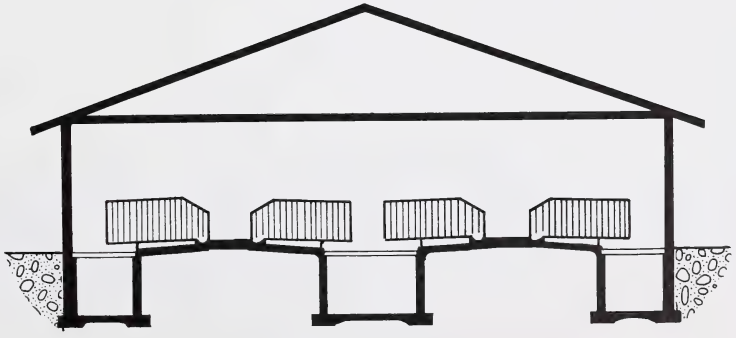
dimensions: width 12600 mm (42 ft)
length as required

construction: 2400 mm (8 ft) stud walls
truss rafter roof

Plans: Construction drawings available. Ask for plan 3241.

... INDIVIDUAL STALLS





1. Boar/Breeding Pens
2. Sow/Gilt Pens
3. Individual Stalls

LAYOUT A303

DRY SOW HOUSING

Layout A304 is for outdoor dry sow housing. A feeding, sleeping area is contained in a single slope shed. An outdoor run provides a place for the waterer and an exercise area for the sows.

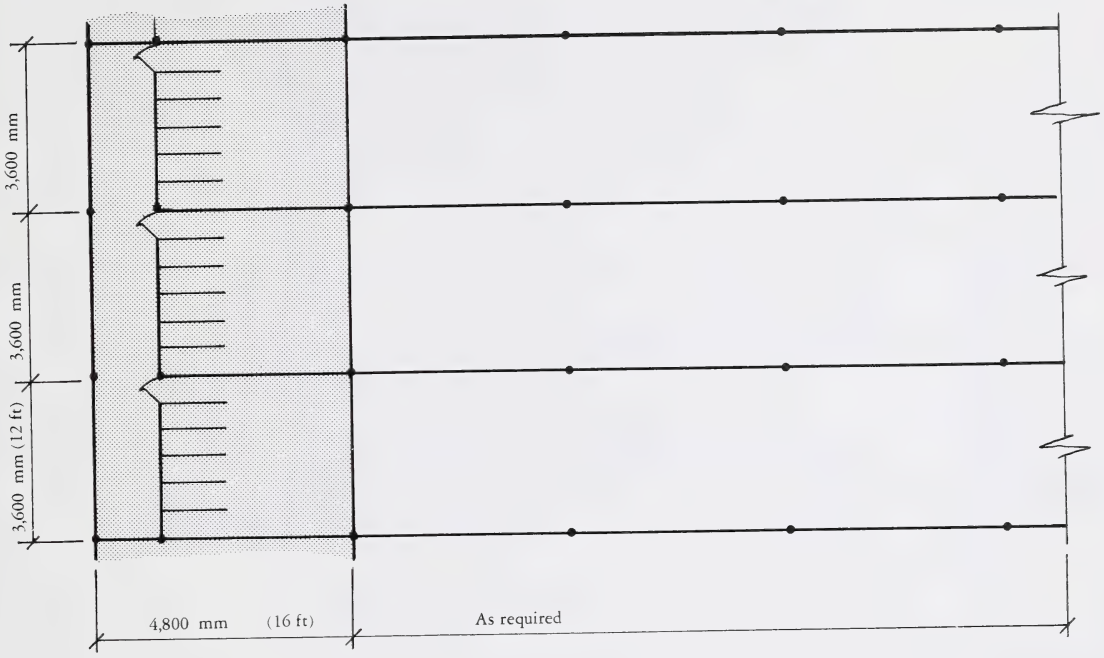
This is a low cost system for housing the breeding herd.

Manure is handled as a solid.

Natural ventilation is used to ventilate the shed.

Barn statistics
dimensions: 4800 mm (16 ft) wide shed
3000 mm - 3600 mm (10 - 12 ft) wide pens
construction: uninsulated

Plans: Construction drawings are **NOT** available for this layout.



LAYOUT A304

DRY SOW HOUSING

Layout A305 shows a double sided outdoor dry sow facility. The shed provides a dry feeding area and a bedded sleeping area.

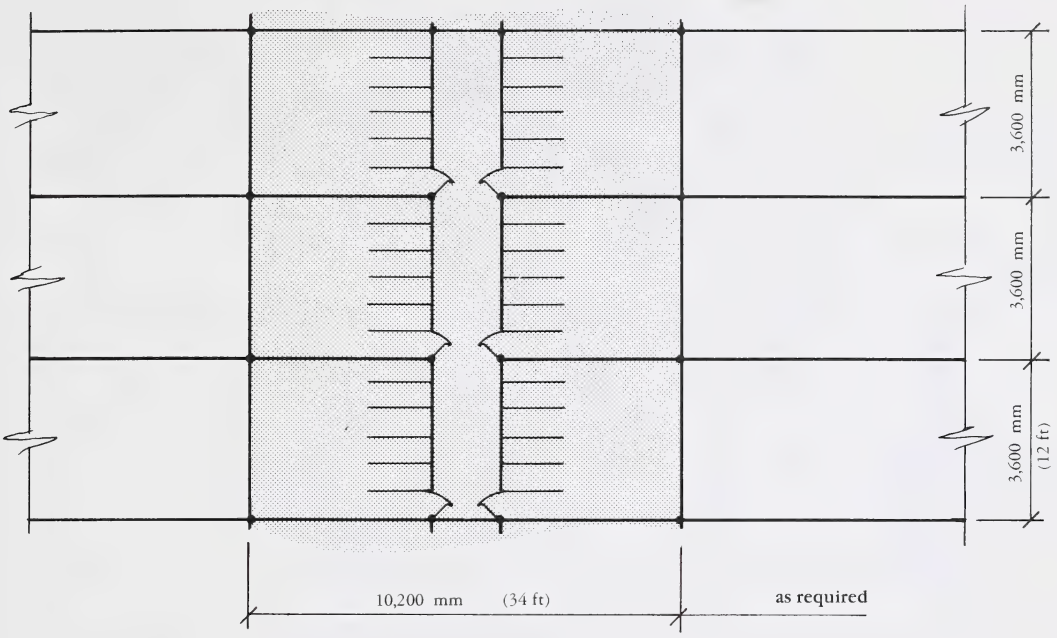
This is a low cost system of sow housing.

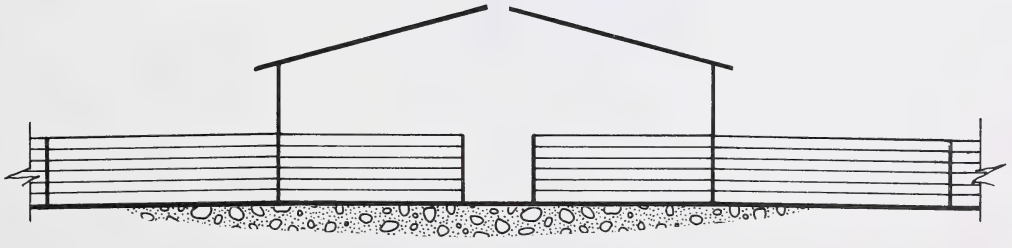
Manure is handled as a solid.

Natural ventilation ventilates the shed.

Barn statistics
dimensions: 10200 mm (34 ft) wide shed
3000 mm to 3600 mm (10 ft -12 ft) wide pens
construction: truss roof, uninsulated

Plans: Construction drawings are **NOT** available for this layout.





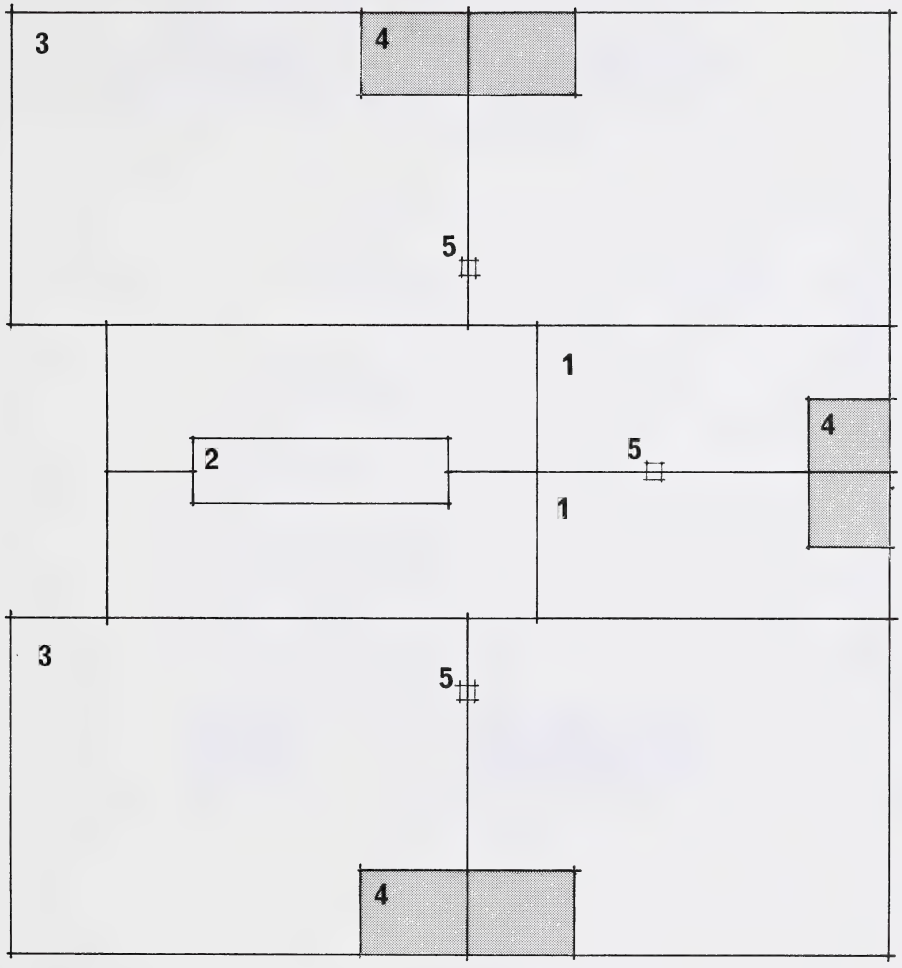
LAYOUT A305

DRY SOW HOUSING

Layout A306 is for outdoor dry sow housing utilizing skip-a-day feeding. With this system each pen of sows is allowed access to a self-feeder for 12 hours every other day. Small bedded shelters are supplied for the sows to sleep in. An area for housing boars and breeding sows is included.

Manure is handled as a solid.

Plans: Construction drawings are **NOT** available for this layout.



1. Breeding Pens
2. Self Feeder
3. Sow Pens
4. Bedded Shelters
5. Waterer

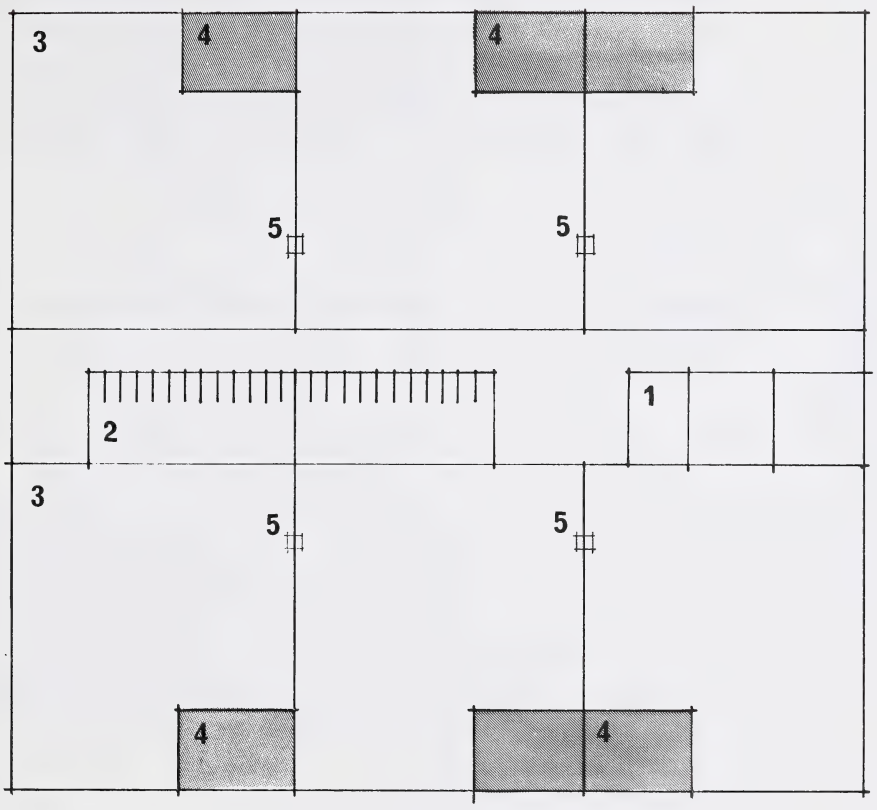
LAYOUT A306

DRY SOW HOUSING

Layout A307 shows a multiple pen arrangement to house dry sows outside. Individual feeding stalls are provided. Straw bedded sheds are used as sleeping areas for the sows. Breeding and boar pens are provided.

Manure is handled as a solid.

Plans: Construction drawings are **NOT** available for this layout.



1. Breeding Pens
2. Individual Feed Stalls
3. Sow Pens
4. Bedded Shelter
5. Waterer

LAYOUT A307

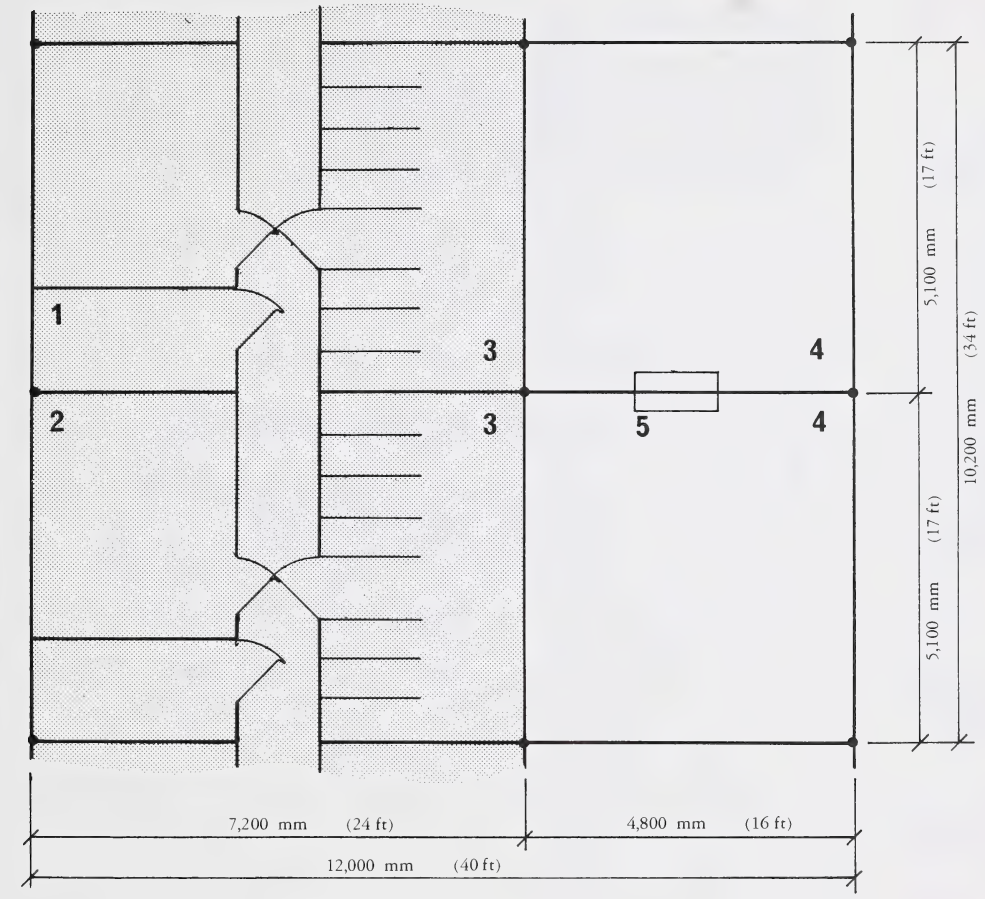
DRY SOW HOUSING

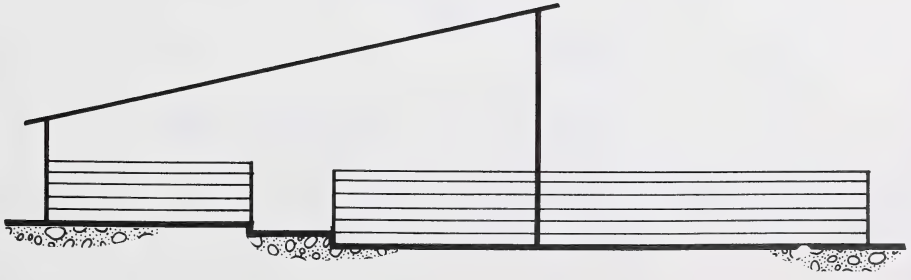
LAYOUT

Layout A308 shows outdoor dry sow housing. Boars and sows to be bred are housed in pens in this shelter. After the sows are bred they are moved to outdoor pens. A bedded sleeping area and a feeding area are provided in the shelter for these sows.

Manure is handled as a solid.

Plans: Construction drawings are **NOT** available for this layout.





1. Boar Pen
2. Pen for Sows/Gilts
3. Eating/Sleeping Area
4. Outdoor Sow Pen
5. Waterer

LAYOUT A308

SWINE HOUSING

LAYOUT

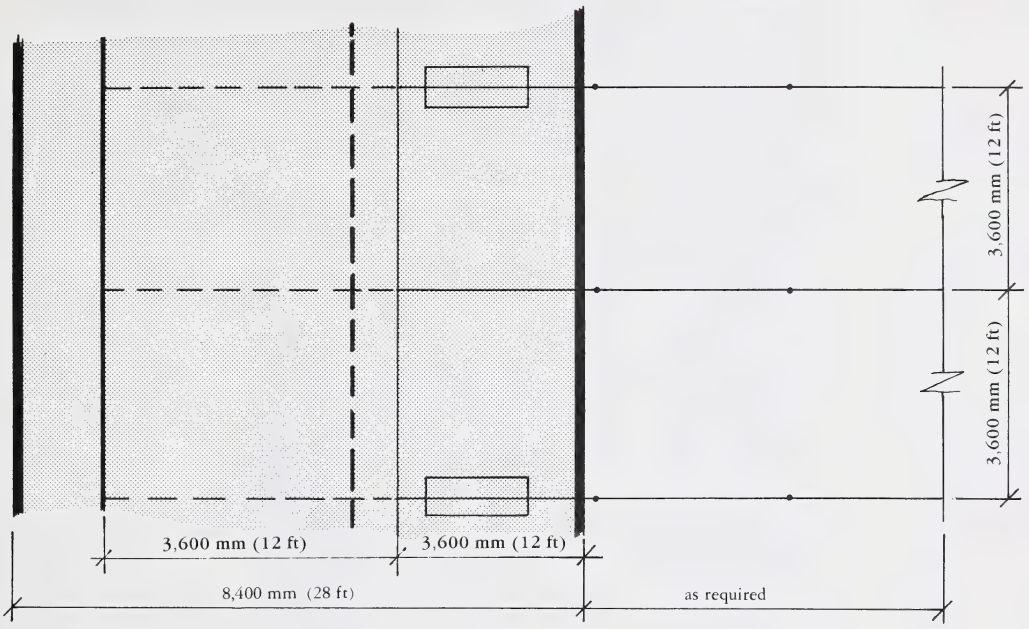
Layout A401 shows a kennel type housing system. It consists of a straw bedded sleeping area, covered with straw bales, a sheltered feeding area and an outdoor run. It can be used for weaners, growers or dry sows.

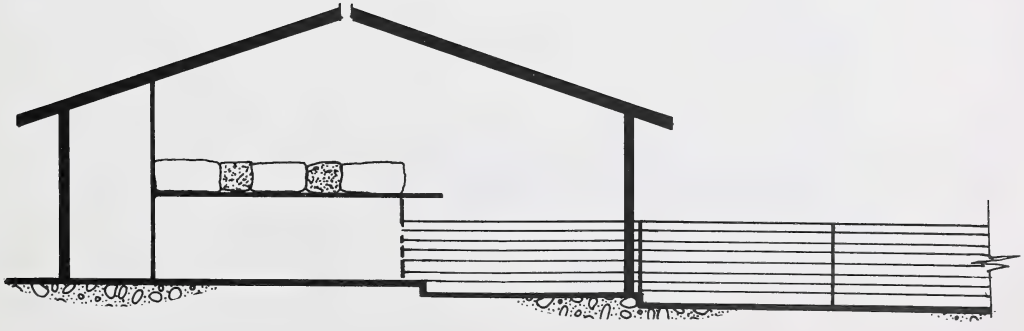
Manure is handled as a solid.

Ventilation is by natural ventilation.

Building statistics
Pole type shelter
Plans: Construction drawings are **NOT** available for this layout.

... KENNEL TYPE





LAYOUT A401

WEANER BARN

Layout A402 shows a one room weaner barn, with floor pens.

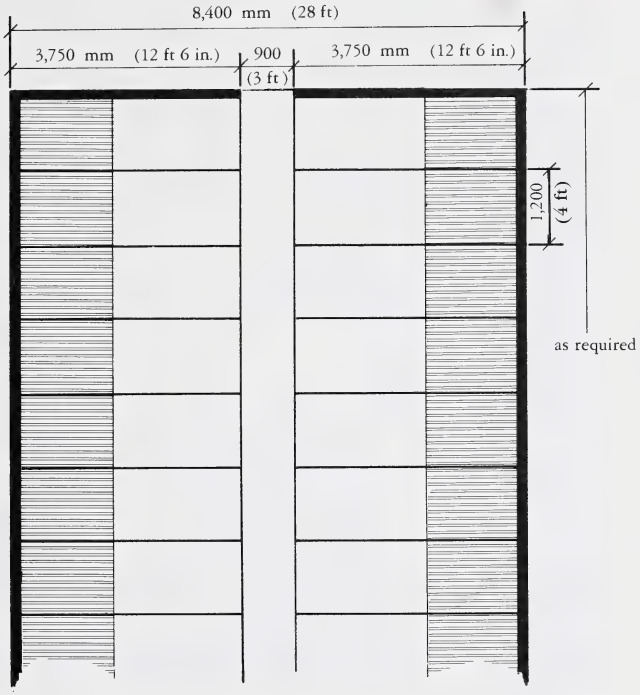
Manure is handled as a liquid. Underslat gutters are used to collect manure, which can then be transported to long term outdoor manure storage.

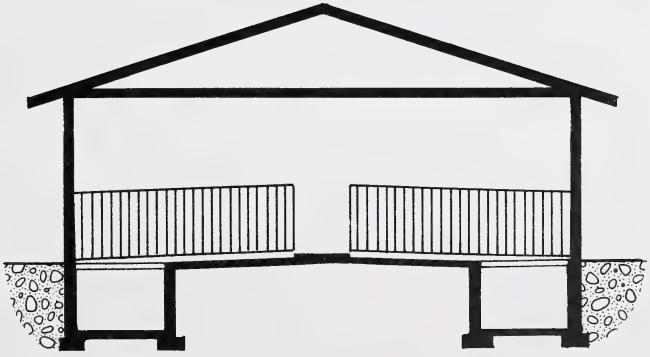
Heating is by hot water space heat and hot water floor heat. Ventilation is by a negative pressure system utilizing exhaust fans and a baffled air inlet.

Barn statistics

dimensions: width 8400 mm (28ft)
length as required
construction: 2400 mm (8 ft) stud walls
truss rafter roof

Plans: Construction drawings available. Ask for plan 3449.


8,400 mm (28 ft)
3,750 mm (12 ft 6 in.)
900
(3 ft)
3,750 mm (12 ft 6 in.)
1,200
(4 ft)
as required



LAYOUT A402

FINISHING BARN

Layout A403 shows a feeder barn. This barn utilizes two rows of pens opening onto a central aisle.

Manure is handled as a liquid. It is collected in gutters and transported to long term outdoor manure storage.

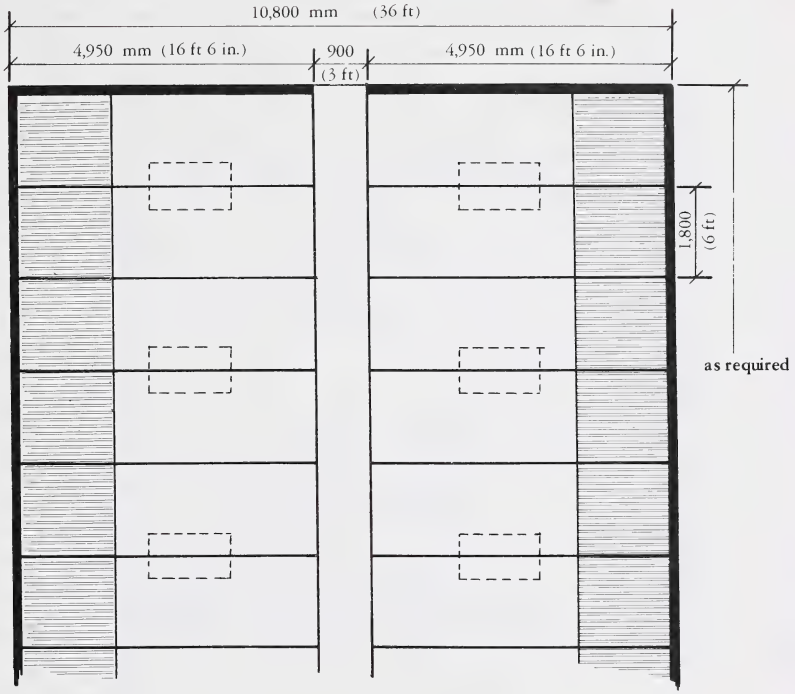
Heating is by hot water space heat and ventilation is by a negative pressure system utilizing exhaust fans and baffled air inlets.

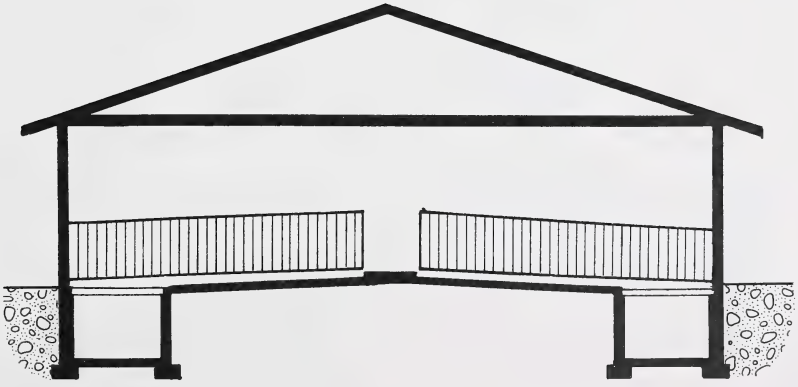
Barn statistics

dimensions: width 10800 mm (36 ft)
length as required
pen size 1500 mm x 4800 mm (5 ft x 16 ft) or
1800 mm x 4800 mm (6 ft x 16 ft)

construction: 2400 mm (8 ft) stud walls
truss rafter roof

Plan: Construction drawings available. Ask for plan 3428.


10,800 mm (36 ft)
4,950 mm (16 ft 6 in.)
900
(3 ft)
4,950 mm (16 ft 6 in.)
1,800
(6 ft)
as required



LAYOUT A403

FINISHING BARN

Layout A404 shows a rigid frame finishing barn. This barn utilizes two rows of pens opening onto a central aisle.

Manure is handled as a liquid. It is collected in gutters and transported to long term outdoor manure storage.

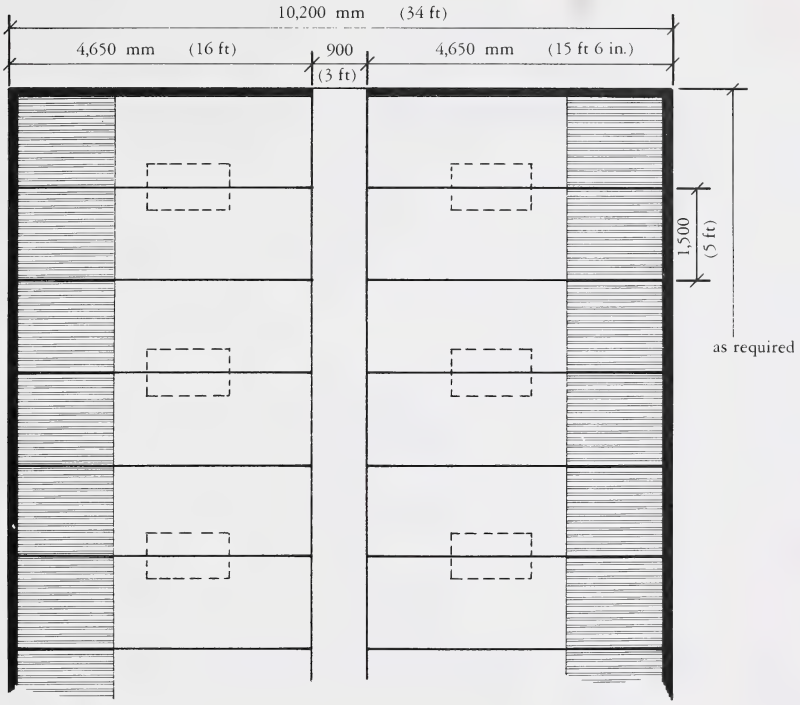
Heating is by hot water space heat and ventilation is by a negative pressure system. The rigid frame shape is well suited to natural ventilation or positive pressure ventilation.

Barn statistics

dimensions: width 10200 mm (34 ft)
length as required
pen size 1500 mm x 4500 mm (5 ft x 15 ft) or
1800 mm x 4500 mm (6 ft x 15 ft)

Plans: Construction drawings available. Ask for plan 3429.

... RIGID FRAME



LAYOUT A404

HOG FEEDER BARN

Layout A405 shows a naturally ventilated hog barn feeder barn. This barn utilizes two rows of pens opening onto a central aisle.

Manure is handled as a liquid, It is collected in gutters and transported to long term outdoor manure storage.

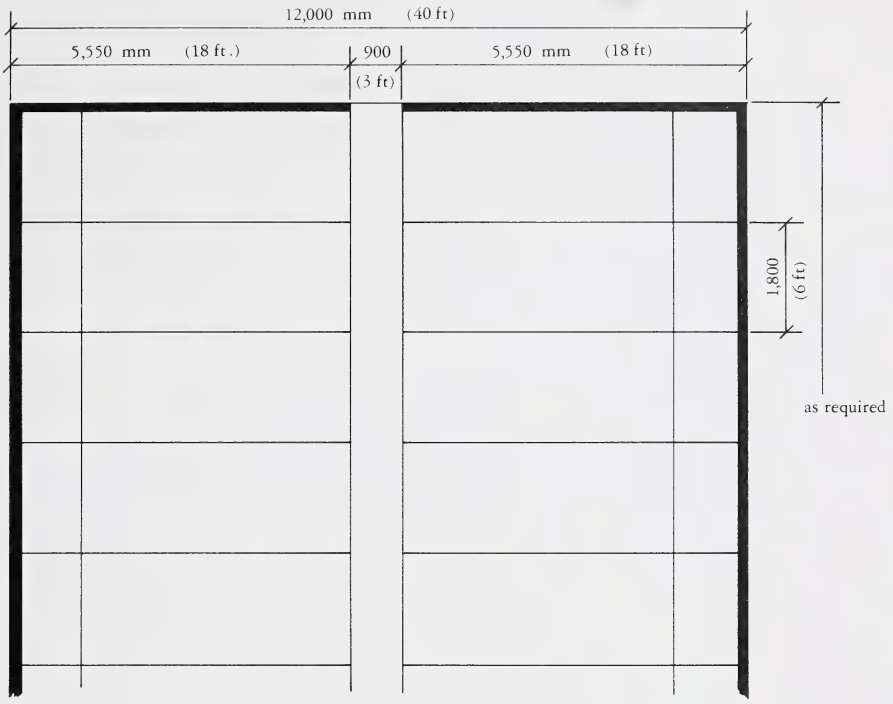
Ventilation is by automatically controlled natural ventilation (ACNV).

Barn statistics

dimensions: Width 12000 mm (40 ft)
Length as required
Pens 1800 mm x 5400 mm (6 ft x 18 ft)

construction: pole supported
prefabbed roof panel construction
or
wood frame construction using scissor trusses

Plans: Construction drawings are available. Ask for Plan 3054.


12,000 mm (40 ft)
5,550 mm (18 ft.)
900
(3 ft)
5,550 mm (18 ft)
1,800
(6 ft)
as required

LAYOUT A405

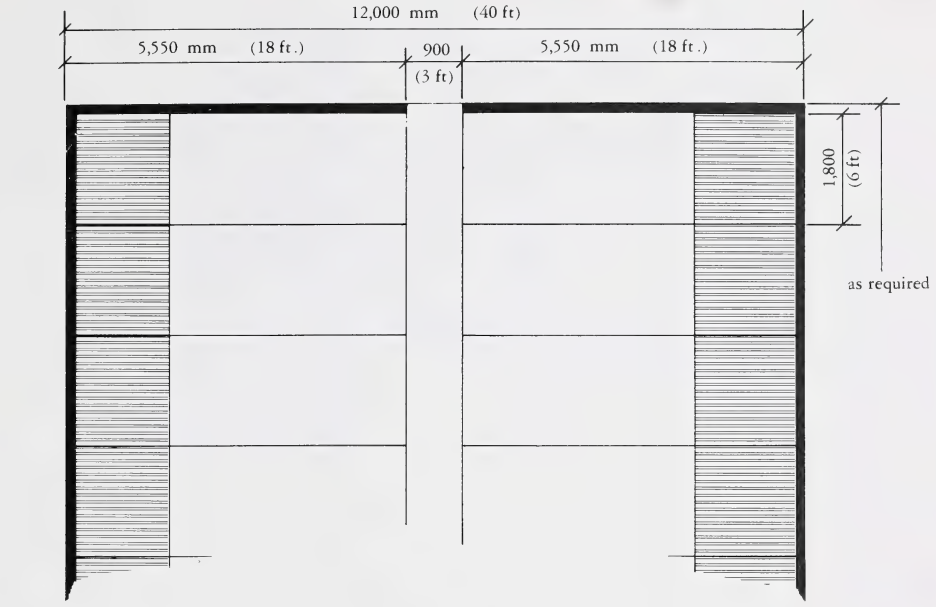
HOG FEEDER BARN

Layout A406 shows a wooden arch hog feeder barn.

Manure is handled as a liquid. It is collected in gutters and transported to long term outdoor manure storage.

Heating is by hot water space heat and ventilation can be by negative pressure ventilation, positive pressure or automatically controlled natural ventilation (ACNV).

Barn statistics
dimensions: width 12000 mm (40 ft)
length as required
construction: prefabricated wooden arch
Plans: Construction drawings are **NOT** available for this layout.


12,000 mm (40 ft)
5,550 mm (18 ft.)
900
(3 ft)
5,550 mm (18 ft.)
1,800
(6 ft)
as required

LAYOUT A406

FARROWING CRATE

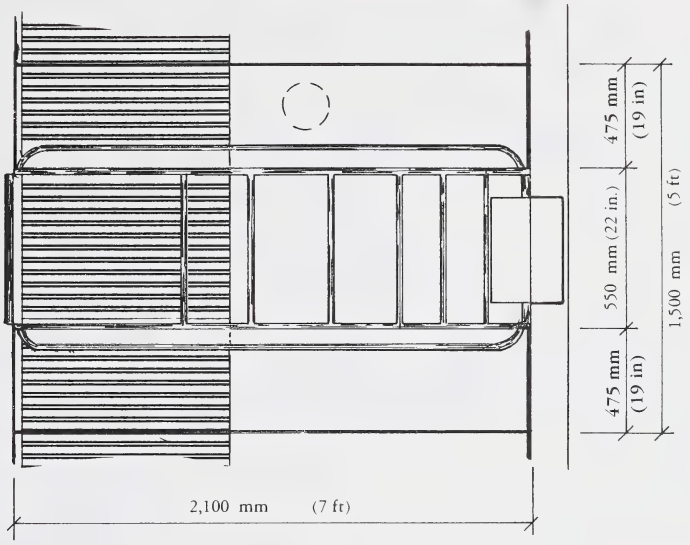
DESIGN

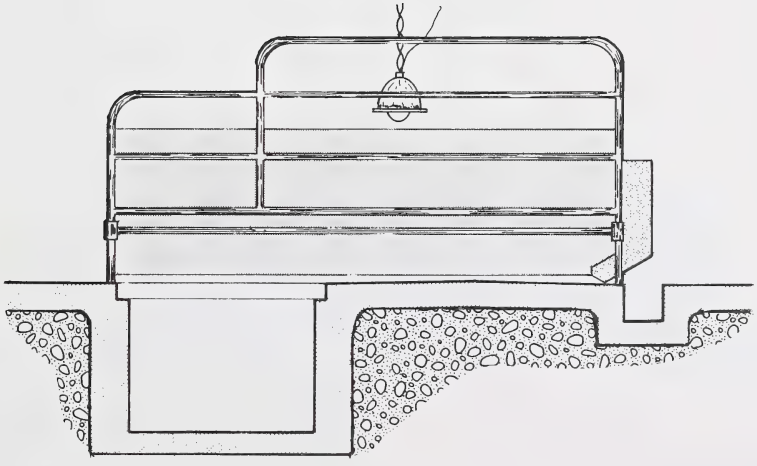
Design A501 shows a floor mounted farrowing crate with side creeps. The rear portion of the crate is over a gutter, the front portion drains into a floor drain.

dimensions: length 2100 mm (7 ft)
width 1500 mm (5 ft)
two side creeps 450 - 500 mm x 2100 mm (18 in x 7 ft)

Plans: Further information available. Ask for leaflets 3812 and 3800.

... WITH SIDE CREEPS





DESIGN A501

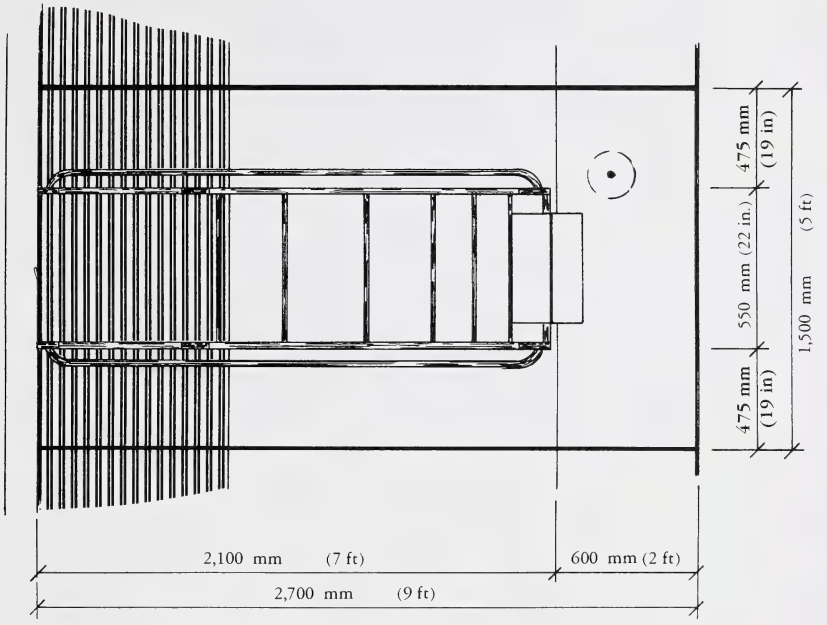
FARROWING CRATE

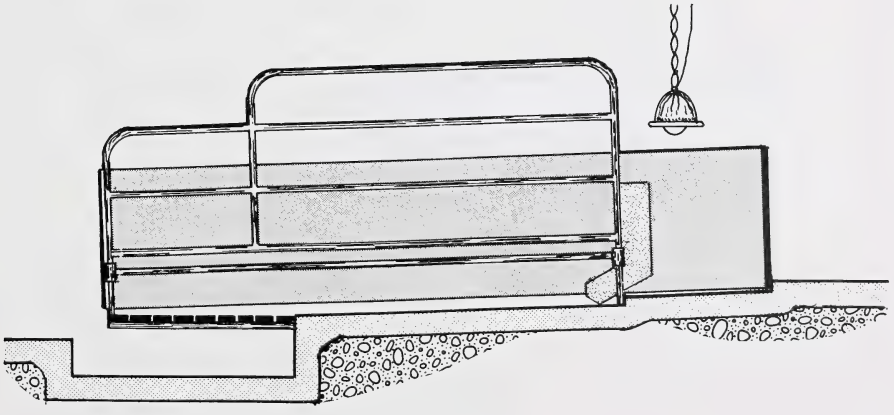
Design A502 shows a cantilever style farrowing crate with front creep.

dimensions: width 1500 mm (5 ft)
length 2700 mm (9 ft)
two side creeps 450 mm - 500 mm x 2100 mm
(18 in x 17 ft)
front creep 600 mm x 1500 mm (2 ft x 5 ft)

Plans: Further information available. Ask for leaflets 3812 and 3800.

... CANTILEVER FRONT CREEP





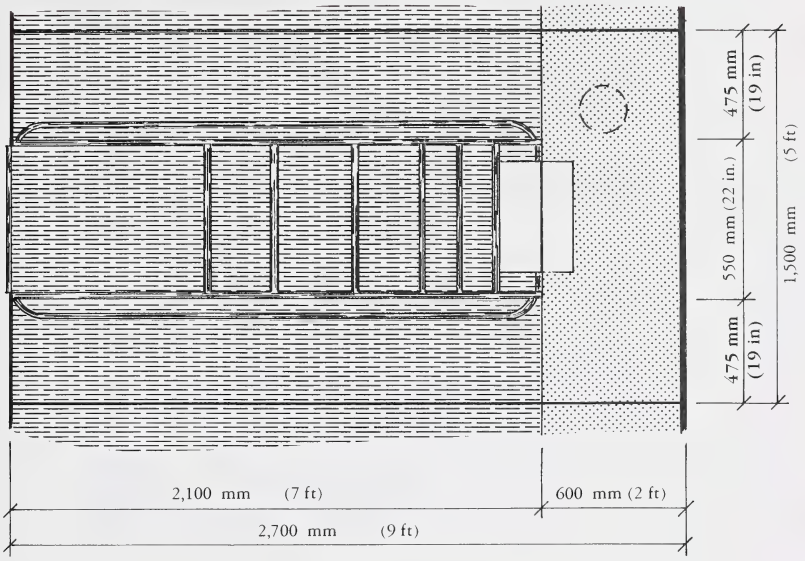
DESIGN A502

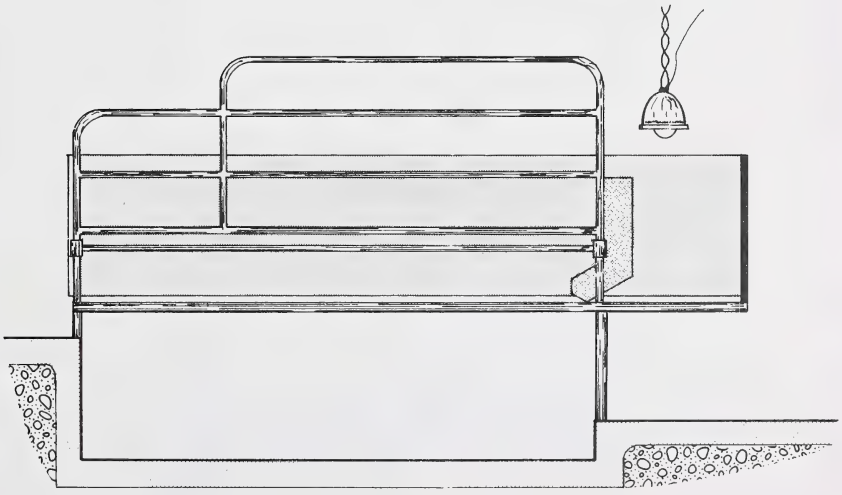
FARROWING CRATE

Design A503 shows a raised farrowing crate with front creep. A totally perforated floor material is placed over a support frame. Manure falls through the totally perforated floor into a manure collection gutter.

dimensions: length 2700 mm (9 ft)
width 2500 mm (5 ft)
two side creeps 450 mm - 500 mm x 2100 mm
(18 in x 7 ft)
front creep 600 mm x 1500 mm (2 ft x 5 ft)

Plans: Further information available. Ask for leaflets 3812 and 3800.


475 mm
(19 in)
550 mm (22 in.)
475 mm
(19 in)
1,500 mm (5 ft)
2,100 mm (7 ft)
600 mm (2 ft)
2,700 mm (9 ft)



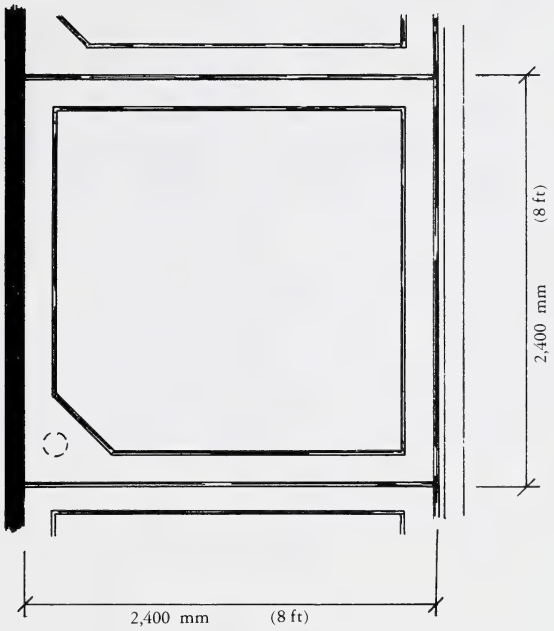
FARROWING PEN

Design A504 shows a straw bedded farrowing pen. A corner is partitioned off and used as a creep area. An anti-crush railing runs around the perimeter of the pen.

Manure is handled as a solid.

dimensions: 2400 mm x 2400 mm (8 ft x 8 ft) straw bedded

Plans: Construction drawings are **NOT** available for this layout.



DESIGN A504

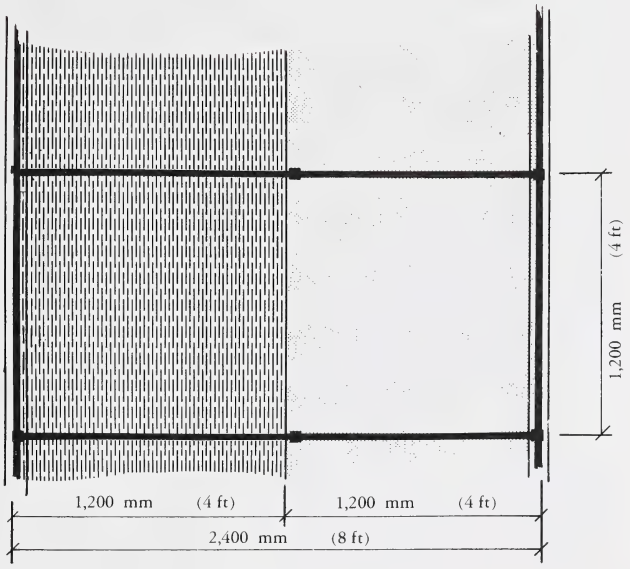
WEANER DECK

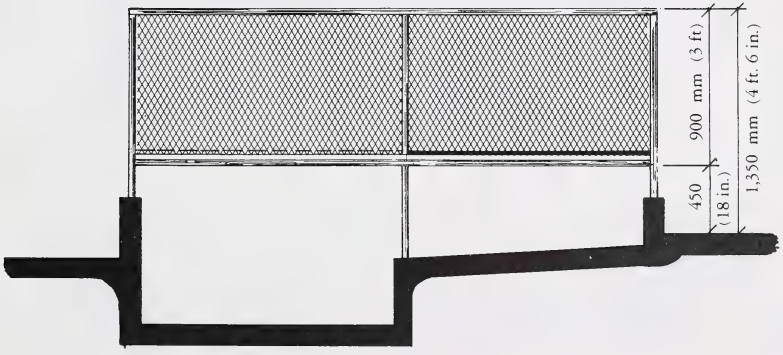
Design A505 shows an elevated weaner deck. The deck has a solid floor under the front part of the pen.

Manure is handled as a liquid. The slatted portion of the deck is placed over a manure gutter which collects manure and wash water. Manure can be transported to long term outdoor manure storage.

Weaner deck statistics
dimension: 2400 mm x 1200 mm (8 ft x 4 ft)
capacity: 12 to 16 - 25 kg pigs
Plans: Plan 3045 can be adapted to this design.

... SOLID FRONT





DESIGN A505

WEANER DECK

Design A506 shows a raised weaner pen. This pen uses one of several commercially available flooring materials. A self-feeder is used to feed the pigs.

Manure is handled as a liquid. A gutter is used to collect the manure, which is then transported to long term outdoor manure storage.

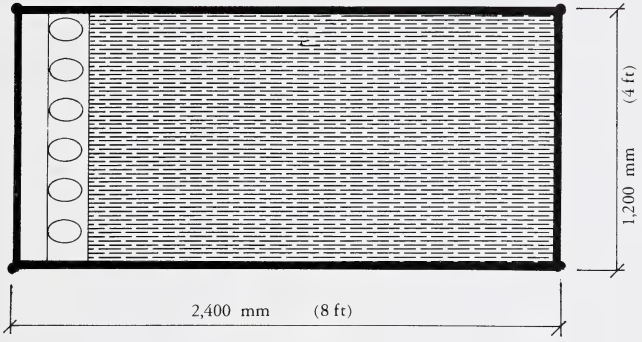
Pen statistics

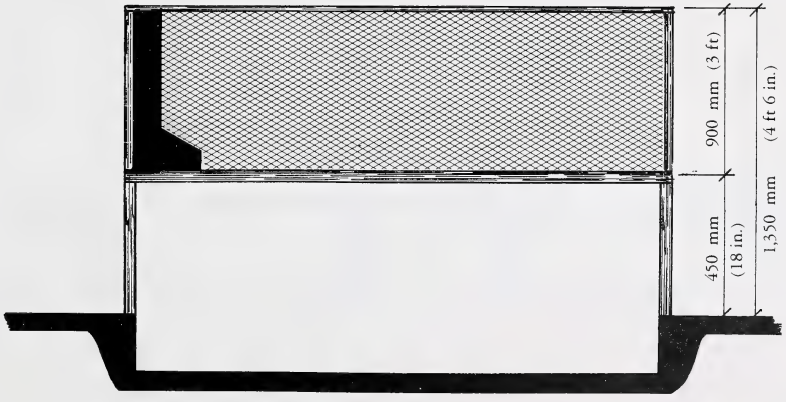
dimensions: 1200 mm x 2400 mm (4 ft x 8 ft)
totally perforated floor
self feeder
nipple waterer(s)

capacity: 12 to 16 - 25 kg pigs

Plans: Plan 3045 can be adapted to this design. Commercially available weaner decks can also be used.

... TOTALLY PERFORATED FLOOR





DESIGN A506

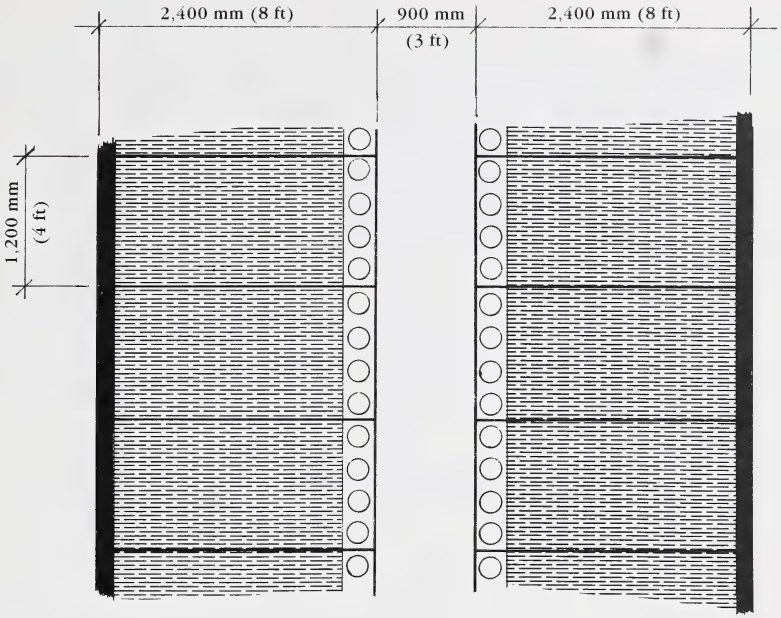
WEANER PENS

Design A507 shows floor-level totally perforated weaner pens. These pens are located over a manure gutter. A self feeder at the front of the pen provides feed for the pigs.

Manure is handled as a liquid. It is collected in underfloor gutters and can be transported to long term outdoor storage.

Plans: Construction drawings are **NOT** available for this layout.

... FLOOR LEVEL



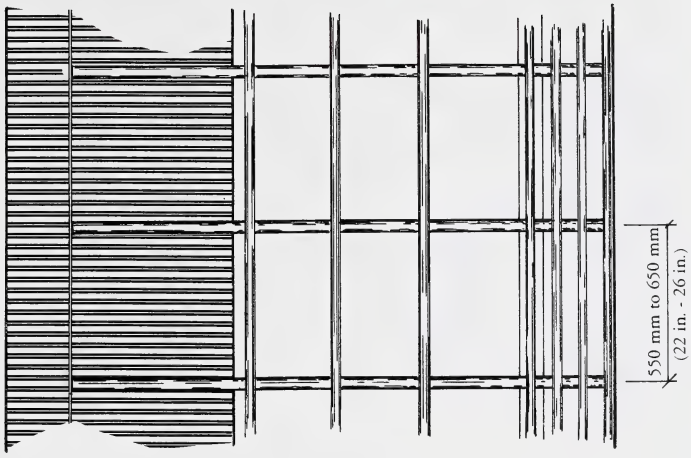
DESIGN A507

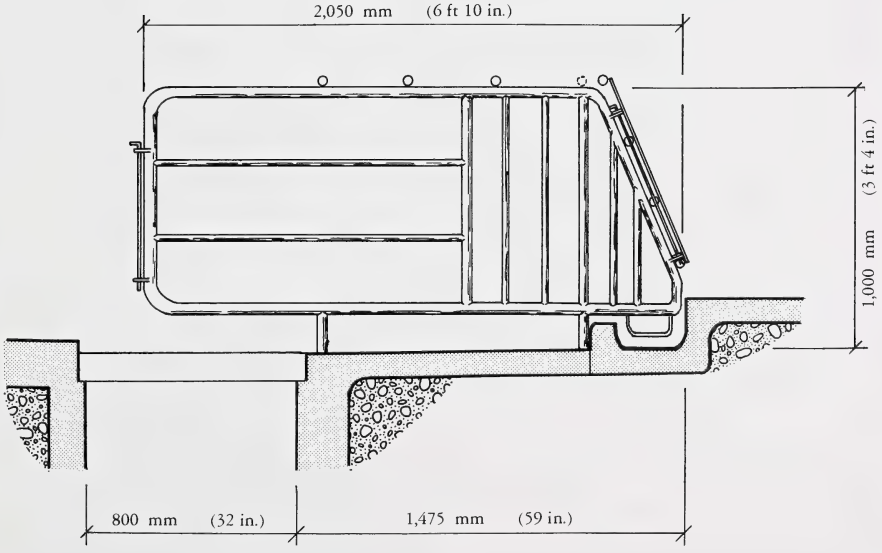
GESTATION STALL

Design A508 shows a stall with the feed trough moulded in the concrete floor.

Manure is handled as a liquid. It is collected in an underslat gutter or in a gutter and transported to long term outdoor manure storage.

Pen Statistics
dimensions: width 550 mm to 650 mm (22 in. - 26 in.)
length 2050 mm (6 ft 10 in.)
height 1000 mm (3 ft 4 in.)
Plans: Plan 3843
Commercial crates available


550 mm to 650 mm
(22 in. - 26 in.)


2,050 mm (6 ft 10 in.)
1,000 mm (3 ft 4 in.)
800 mm (32 in.)
1,475 mm (59 in.)

DESIGN A508

GESTATION PEN STALL

Design A509 shows a stall with a self contained metal feed trough.

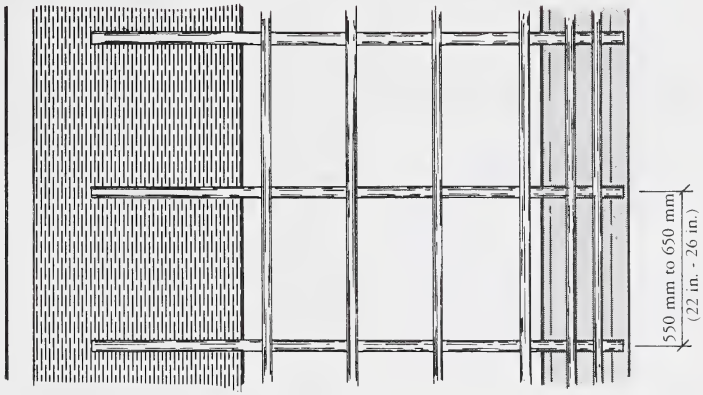
Manure is handled as a liquid. It is collected in an underslat gutter or in a gutter and transported to long term outdoor manure storage.

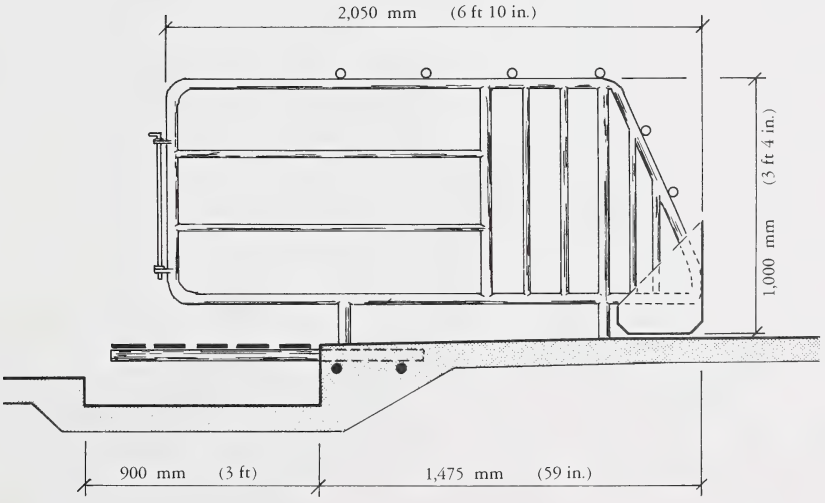
Pen Statistics

dimensions: width 550 mm to 650 mm (22 in. - 26 in.)
length 2050 mm (6 ft 10 in.)
height 1000 mm (3 ft 4 in.)

Plans: Plan 3843

Commercial crates available


550 mm to 650 mm
(22 in. - 26 in.)


2,050 mm (6 ft 10 in.)
1,000 mm (3 ft 4 in.)
900 mm (3 ft)
1,475 mm (59 in.)

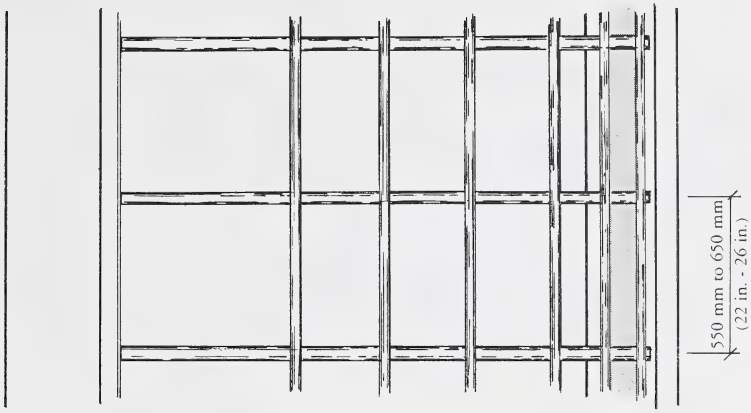
DESIGN A509

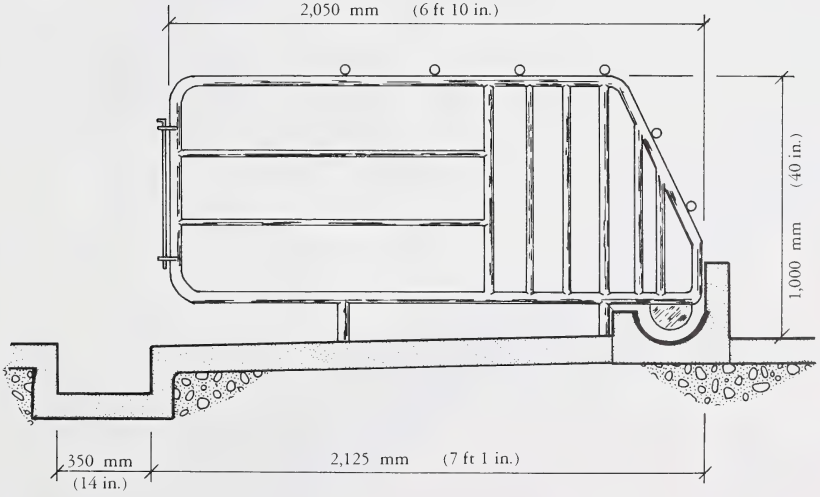
GESTATION PEN STALL

Design A510 shows a stall with the feed trough paved above the floor.

Manure is handled as a liquid. It is collected in an underslat gutter or in a gutter and transported to long term outdoor manure storage.

Pen Statistics
dimensions: width 550 mm to 650 mm (22 in. - 26 in.)
length 2050 mm (6 ft 10 in.)
height 1000 mm (3 ft 4 in.)
Plans: Plan 3843
Commercial crates available


550 mm to 650 mm
(22 in. - 26 in.)


2,050 mm (6 ft 10 in.)
1,000 mm (40 in.)
350 mm
(14 in.)
2,125 mm (7 ft 1 in.)

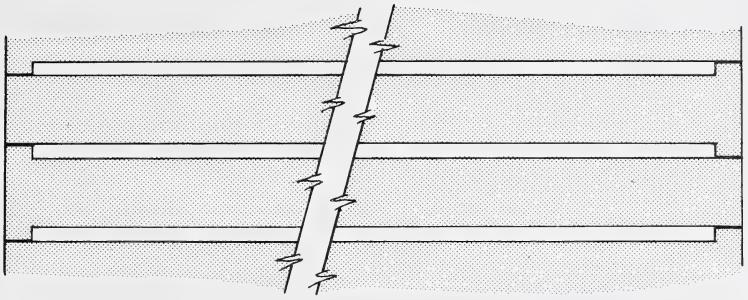
DESIGN A510

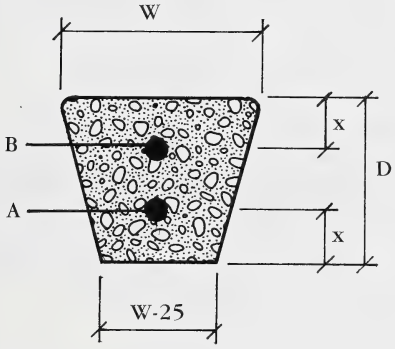
CONCRETE SLATS

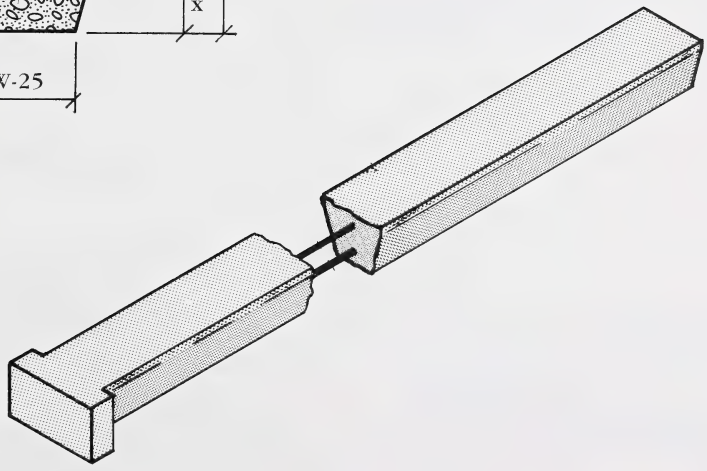
Design A511 shows reinforced concrete slats. Reinforced concrete, slats are used in feeder barns and dry sow barns.

Slat Span Table

Sows	Feeder Hogs	Dimension (mm)			Bar Size	
225 kg wt	100 kg wt	D	W	X	A	B
Up to 1500 mm (5 ft)	up to 1800 mm (6 ft)	100	125	30	10M	10M
1600 - 2000 mm (5 - 6 ft)	2000 - 2400 mm (6 - 8 ft)	100	125	30	15M	10M
2000 - 2500 mm (6 - 8 ft)	2500 - 3200 mm (8 - 10 ft)	140	125	40	15M	10M







DESIGN A511

FLOORING MATERIALS

Design A512 shows some of the commonly available flooring materials used in hog barns.

1. Plastic coated, Unflattened Expanded Metal

- support at 300 mm centres (1 ft)
- available in two sizes; one for farrowing crates and a smaller size for weaner decks.

2. Moulded Plastics

- support at 600 mm centres (2 ft)
- sows may have difficulty in gaining footholds; low incidence of piglet injury; suitable for weaner decks.

3. Perforated Metal Planks

- self supporting up to 1200 mm centres (4 ft)
- indented holes may reduce piglet foot and leg injury; sows tend to have difficulty in gaining secure foothold; suitable for flat decks.

4. Fibreglass T Slats

- 38 mm (1 1/2 in.) slats spaced 9 mm (3/8 in.) apart are used for weaner areas
- can also be used in farrowing crates and finishing barns

5. Flattened Expanded Metal

- support at 300 mm centres (1 ft)
- not suitable for farrowing pens with piglets less than 14 days old
- limited life span unless well supported
- keeps clean
- suitable for flat decks

6. Woven Wire

- support at 300 mm centres (1 ft)
- suitable for farrowing pens
- low incidence of piglet foot and leg injury at birth

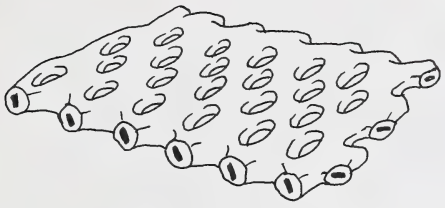
7. Welded Wire

5.3 mm (5 gauge) wire at 12.5 mm centres (1/2 in.)
5.3 mm (5 gauge) wire at 15 mm centres (5/8 in.)
5.3 mm (5 gauge) wire at 18 mm centres 3/4 in.)

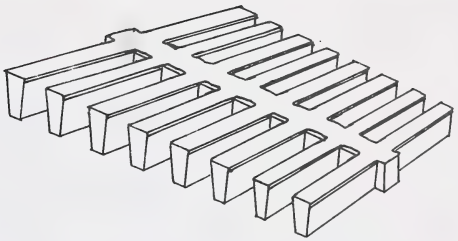
- support at 300 mm suitable for farrowing pens (12 in.)
- low incidence of piglet foot and leg injury at birth

8. Cast Iron

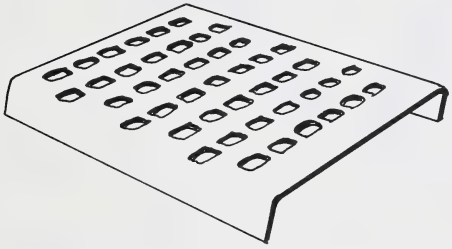
- self supporting to 1200 mm (4 ft)
- suitable for all classes of swine



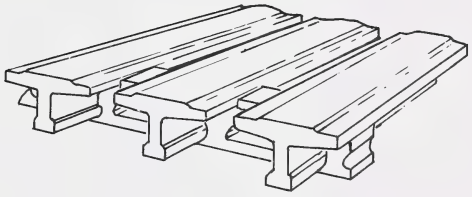
1. Plastic coated, Unflattened Expanded Metal



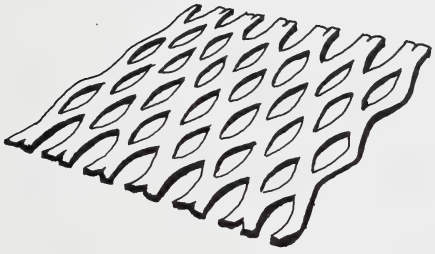
2. Moulded Plastics



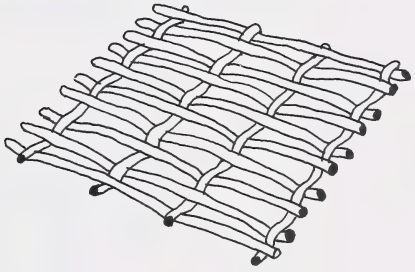
3. Perforated Metal Planks



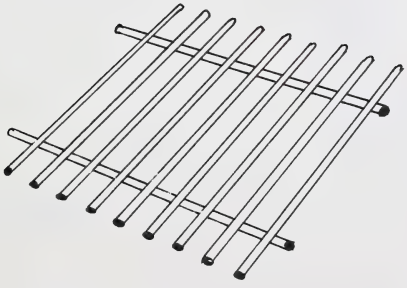
4. Fibreglass T Slats



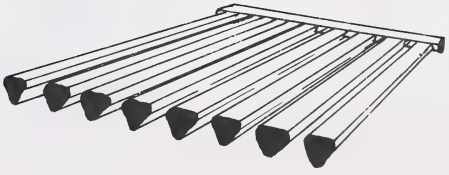
5. Flattened Expanded Metal



6. Woven Wire



7. Welded Wire



8. Cast Iron

MANURE GUTTERS

Designs A513, A514, A515 show some of the alternatives available for manure collection and storage. The present trend is to keep the in-barn storage as short as possible and use long term outdoor storage.

A513

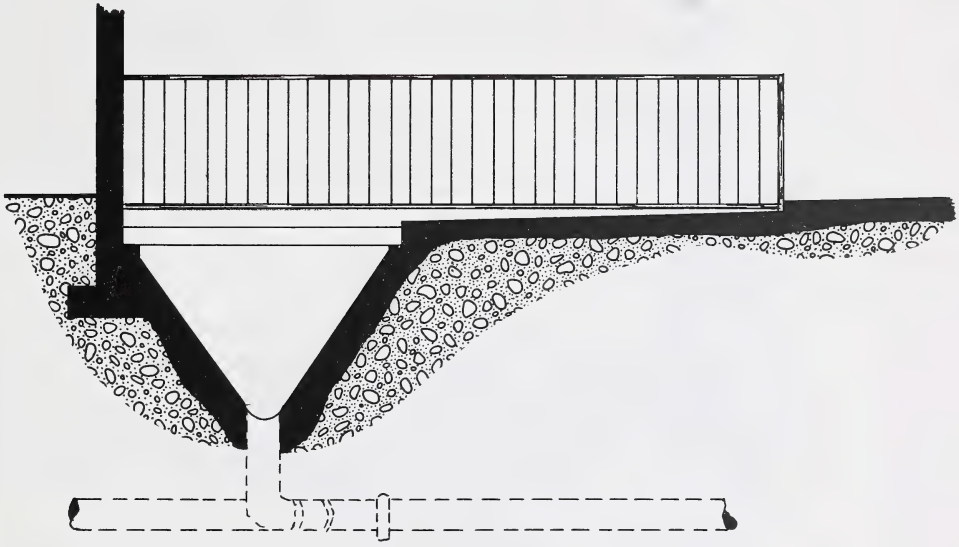
V Gutter

width: 1500 mm (5 ft)
depth: 600-1200 mm (2 ft - 4 ft)
bottom width: 450 mm (18 in.)

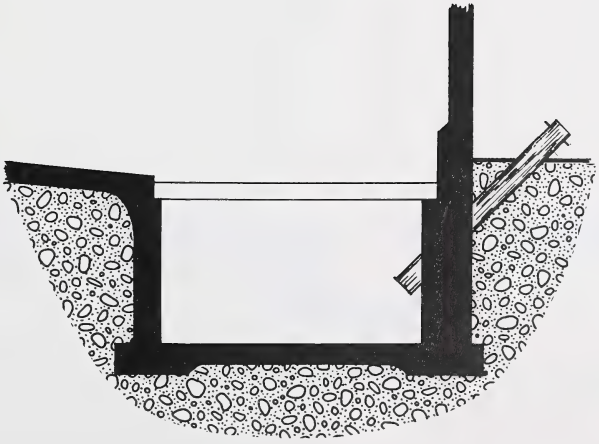
•Used for applications where it is desirable to drain the gutter.

Conventional gutter

width: 600-2400 mm (2 ft - 8 ft)
depth: 600-2400 mm (2 ft - 8 ft)
•Used for underslat manure collection
•Can be drained
•Deep long gutters should have cross walls every 10-15 m (30'- 50').



V-GUTTER



GUTTER

MANURE GUTTERS

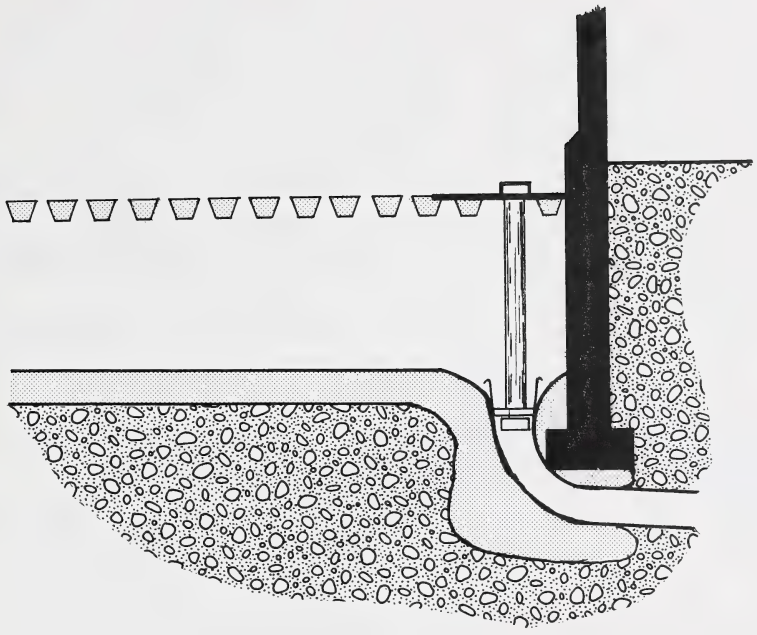
A514

Pull the plug

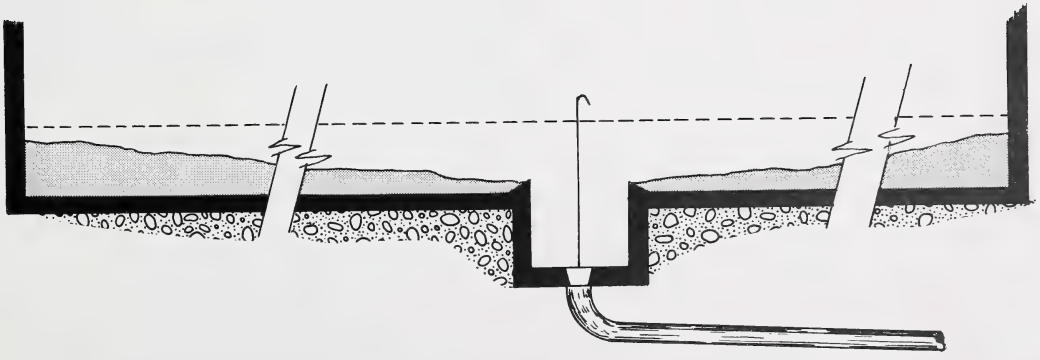
•This system can be used with V or conventional gutters to drain manure to long term outdoor manure storage.

Lip or continuous flow gutter

•This gutter system utilizes a 50 mm - 100 mm (2 in. - 4 in.) lip to retain liquids in the bottom of the pit. Solids float on top of the liquids and flow to a collection area. Manure in the collection area is transported to long term storage. In some cases a flushing system is used to assist in manure flow out of the gutter.



PULL THE PLUG



LIP OR CONTINUOUS FLOW GUTTER

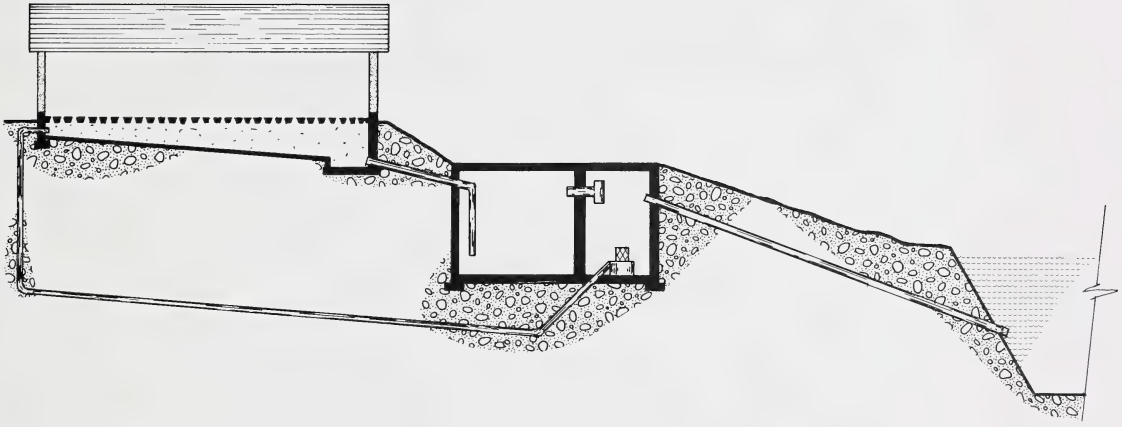
MANURE GUTTERS

A515

Flush gutter

- Flush gutters use recirculated manure, recirculated manure liquid or fresh water to flush manure out of the barn. A slope of 1-3% is used on the gutter flow.

Detailed information on these and other manure systems is contained in the publication **SWINE MANURE HANDLING SYSTEMS** (available from Print Media Branch, Alberta Agriculture, Agdex 440/727-1).



FLUSH GUTTER SYSTEM

1. Gutter
2. Gravity Drain
3. Return Line
4. Gas Trap
5. Settling Tank
6. Wet Well
7. Submersible Manure Pump
8. Long Term Storage

APPENDIX A

Appendix A is a list of some of the common items used in constructing a hog barn. You can use these sheets to estimate the cost of your barn.

description	Item Cost	
Footings, Foundation and Floor		
Site Preparation	_____	
Excavating & backfilling	_____	
Gravel	_____	
Concrete	_____	
Reinforcing	_____	
- rods	_____	
- mesh	_____	
Forms & ties	_____	
Perimeter insulation	_____	
Floor slats	_____	
Manure pits	_____	
Other	_____	_____
Wall and Partitions		
Dimension lumber	_____	
Exterior sheathing	_____	
Interior sheathing	_____	
Vapor barrier	_____	
Insulation	_____	
Poles	_____	
Blocks	_____	
Siding (finishes)	_____	
Other	_____	_____
Roof and Ceiling		
Trusses	_____	
Purlins	_____	
Exterior sheathing	_____	
Shingles or roofing	_____	
Interior sheathing	_____	
Vapor barrier	_____	
Insulation	_____	
Other	_____	_____
Heating and Ventilation		
Furnace & ducts	_____	
Boiler & pipes	_____	
Fans & thermostats	_____	
Air inlets	_____	
Louvres	_____	
Heat mats, heat cables	_____	
Electric heaters	_____	
Gas installation	_____	
Fuel storage	_____	
Other	_____	_____
Electrical Wiring		
Wiring	_____	
Electrical fixtures	_____	
Lighting fixtures	_____	
Controls	_____	
Standby power	_____	
Other	_____	_____

Water System
Well or dugout _____
Pressure system _____
Trenching & piping _____
Other _____ _____

Sewer System
Plumbing fixtures _____
Septic tank _____
Trenching & piping _____
Other _____ _____

Manure Disposal System
Alley scraper _____
Gutter cleaner _____
Manure pump _____
Manure storage _____
Manure spreader _____
Other _____ _____

Hardware
Nails _____
Paint _____
Eavestrough _____
Ridge cap _____
Anchor bolts _____
Doors & windows _____
Waterproofing _____
Glue _____
Screws _____
Bolts _____
Hinges _____
Other _____ _____

Permits
Electrical _____
Plumbing _____
Gas _____
Highways _____
Building _____
Municipal _____
Certificate of Compliance _____
Health _____
Other _____ _____

Miscellaneous
Insurance _____
Access road _____
Drainage _____
Landscaping _____
Equipment rental _____
Special tools & equipment _____
Freight _____
Telephone _____
Engineering services _____
Legal Fees _____
Other _____ _____

Hogs
Farrowing crates _____
Weaner pens _____
Feeder pens _____
Feeding system _____
Water bowls or nipples _____
Spray cooling _____
Loading and handling facilities _____
Other _____ _____

Other
_____ _____
_____ _____
_____ _____
_____ _____ _____

_____

APPENDIX B

table of the space requirements for swine.

Accommodation	Sows
Feedlot	
-hard surfaced area	2.3m² per sow
-pasture area	0.4ha per 2 sows and litters
Confinement Housing	
-solid floor pen area	1.8m² per sow under 180 kg 2.0m² per sow over 180 kg
Slotted floor pens	
-total pen floor area	1.5m² per sow under 180 kg 1.9m² per sow over 180 kg
-slotted floor area	35-100%
-slot width	25-32mm
-slat width	28-230mm
Partition Height	1070mm
Self-feeder Length	(not recommended)
Feed Trough Length	450-600mm per sow
Individual Feeding Stall Dimensions	450mm wide 600-1800mm long
Gestation Tie Stall	
-width	600-700mm
length: feed trough	
-to gutter	1450-1650mm
-to slotted floor	1200mm
Gestation Pen Stall	
-width	660mm
-length	1800mm
-height	1060mm
Farrowing Pen Dimensions	
-side creeps, early weaning	1500 x 2100mm
-side creeps, late weaning	1800 x 2100mm
-front creep	1500 x 2700mm
-clearance under partition	200-250mm
Feed	1 ton per sow per year

... SPACE REQUIREMENTS TABLE

Accommodation	Feeders (22-90kg)
Feedlot	
-hard surfaced area	1.9m² per pig
-pasture area	0.4 ha per 10 pigs
Confinement Housing	
-solid floor pen area	0.5m² per pig under 45 kg 0.8m² per pig 45 - 90 kg
Slotted floor pens	
-total pen floor area	0.35m² per pig 22-45 kg 0.5m² per pig 45 - 67 kg 0.7m² per pig 67 - 90 kg
-slotted floor area	30-100%
-slot width	25-32mm
-slat width	28-230mm
Partition Height	900mm
Self-feeder Length	75mm per pig
Feed Trough Length	330mm per pig
Feed	295-325 kg (birth - 90 kg)

Accommodation	Weaners (under 22kg)
Feedlot	
-hard surfaced area	0.75m² per pig
-pasture area	0.4 ha per 25 pigs
Confinement Housing	
-solid floor pen area	0.2-0.4m² per pig
Slotted floor pens	
-total pen floor area	0.2-0.3m² per pig
-slotted floor area	30-100%(100% preferred)
-slot width	9 or 25mm
-slat width	38-130mm
Partition Height	700mm
Self-feeder Length	50mm per pig
Feed Trough Length	250mm per pig

APPENDIX C

Regional agriculture engineers are located at:

Alberta Agriculture
Provincial Building
Bag Service #1
AIRDRIE, AB
T0M 0B0
Phone: 948-5101

Alberta Agriculture
Provincial Building
Box 1540
BARRHEAD, AB
T0G 0E0
Phone: 674-8253

Alberta Agriculture
Provincial Building
Box 7777
FAIRVIEW, AB
T0H 1L0
Phone: 835-2291

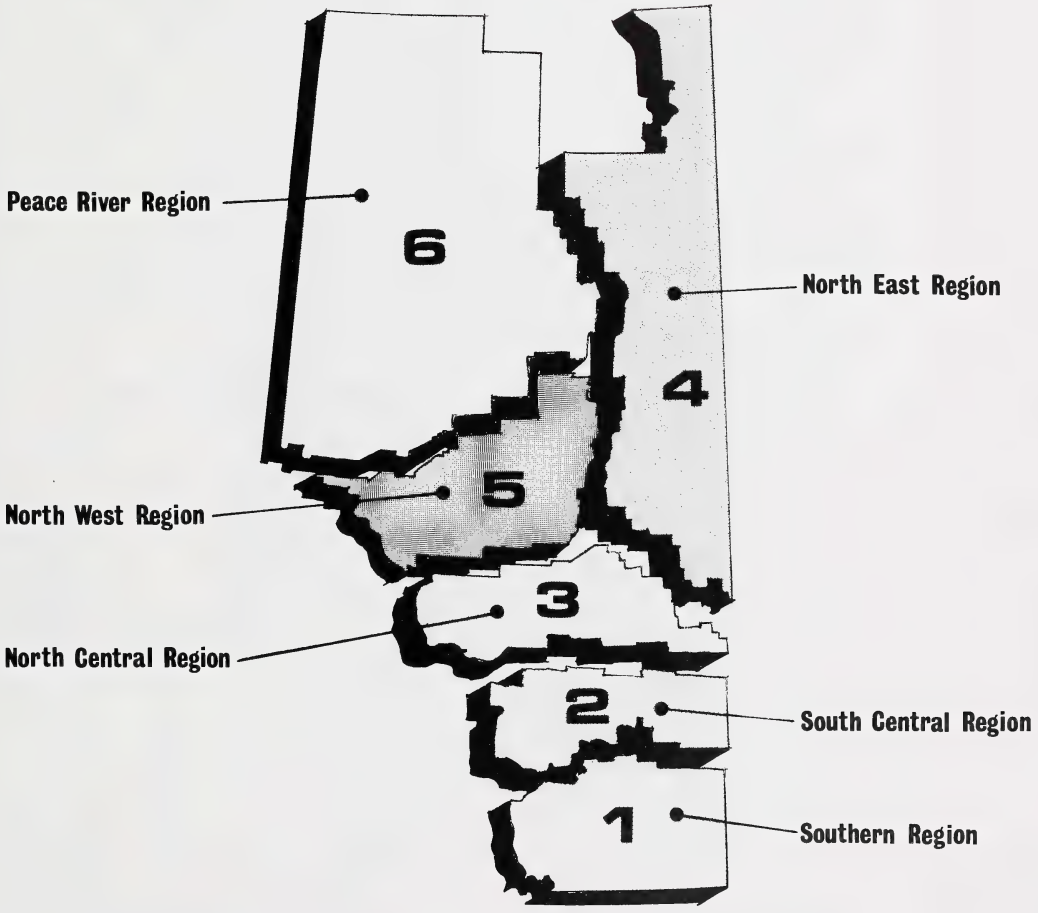
Alberta Agriculture
2nd Floor J. G. O'Donoghue Building
7000 - 113 Street
EDMONTON, AB
T6H 5T6
Phone: 427-2181

Alberta Agriculture
Agriculture Centre
LETHBRIDGE, AB
T1K 4C7
Phone: 329-5113

Alberta Agriculture
Provincial Building
3rd Floor
4920 - 51 Street
RED DEER, AB
T4N 6K8
Phone: 343-5322

Alberta Agriculture
Provincial Building
Box 330
VERMILION, AB
T0B 4M0
Phone: 853-2811

... THE REGIONS


Peace River Region
6
North East Region
4
5
North West Region
3
North Central Region
2
South Central Region
1
Southern Region

APPENDIX D

General Conversions

Length:	1 mm = 0.0394 in. 1 m = 3.281 ft. 1 km = 0.621 miles
Area:	1 m^2 = 10.76 ft^2 1 ha = 2.471 acres
Volume:	1 mL = 0.035 fl.oz.(Imp.) 1 L = 0.220 gal.(Imp.) 1 m^3 = 35.31 ft^3 1 m^3 = 1.308 yd^3
Mass:	1 g = 0.035 oz. 1 kg = 2.205 lb. 1 t = 1.102 ton
Density:	1 kg/m^3 = 0.0624 lb/ft^3
Force:	1 kN = 224.8 lb. force
Pressure:	1 MPa = 145 lb/in^2(psi)
Fluid Flow:	1 L/s = 2.12 ft^3/min.(cfm)
Energy:	1 mJ = 947.9 BTU
Power:	1 kW = 1.341 hp

Modular Dimensions

1/8" = 3 mm
1/4" = 6 mm
3/8" = 10 mm
1/2" = 13 mm
5/8" = 16 mm
3/4" = 19 mm
1" = 25 mm
4" = 100 mm
6" = 150 mm
8" = 200 mm
9 ½" = 240 mm
12" = 300 mm
16" = 400 mm
19" = 480 mm
24" = 600 mm
32" = 800 mm
48" = 1200 mm
6 ft. = 1800 mm
8 ft. = 2400 mm
10 ft. = 3000 mm
12 ft. = 3600 mm
14 ft. = 4200 mm
16 ft. = 4800 mm

Roof Loading

1 kN/m^2 = 20 psf (approx.)
1 kN/m^2 = 20.89 psf

Sawn Lumber Sizes

IMPERIAL		METRIC
Nominal	Actual	
1"	3/4"	19 mm
2"	1 ½"	38 mm
3"	2 ½"	64 mm
4"	3 ½"	89 mm
6"	5 ½"	140 mm
8"	7 ¼"	184 mm
10"	9 ¼"	235 mm
12"	11 ¼"	286 mm

Insulation R-Values

IMPERIAL	METRIC
R8	RSI 1.4
R12	RSI 2.1
R14	RSI 2.5
R20	RSI 3.5

... METRIC CONVERSION TABLES

Softwood Plywood

WIDTH = 1200 mm LENGTH = 2400 mm

	THICKNESS	
Imperial (nominal)	Metric (actual) sanded	sheathing
1/4"	6 mm	–
5/16"	–	7.5 mm
3/8"	8 mm	9.5 mm
1/2"	11 mm	12.5 mm
5/8"	14 mm	15.5 mm
3/4"	17 mm	18.5 mm

Vapour Barriers

IMPERIAL	METRIC
2 mil	50 μm
4 mil	100 μm
6 mil	150 μm
10 mil	250 μm

Sheet Metal Thickness

GAUGE(USS)	METRIC
12	3.0 mm
14	2.0 mm
16	1.6 mm
18	1.2 mm
20	1.0 mm
22	0.8 mm
24	0.6 mm
26	0.5 mm
28	0.4 mm
30	0.3 mm

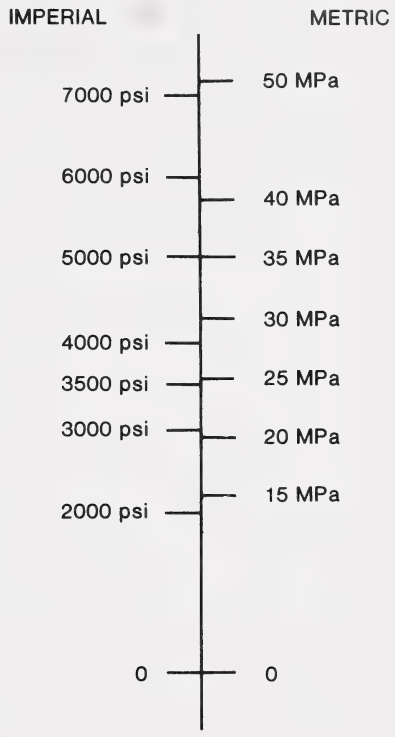
Rebar Sizes (approximate)

IMPERIAL	METRIC	AREA OF SECTION
3,4	10M	100 mm^2
5	15M	200 mm^2
6,7	20M	300 mm^2
8	25M	500 mm^2
9	30M	700 mm^2
10	35M	1000 mm^2
14	45M	1500 mm^2

Bolt Sizes (diameter)

IMPERIAL	METRIC
1/4"	M6
5/16"	M8
3/8"	M10
1/2"	M12
9/16"	M14
5/8"	M16
11/16"	M18
3/4"	M20

Concrete Strength (approximate)



Grain Bin Capacity

1 Tonne = 1000 kg = 2205 lb.
1 m^3 = 35.3 ft^3

Wheat:	1 Tonne = 1.33 m^3 = 36.7 bu.
Rye:	1 Tonne = 1.43 m^3 = 39.4 bu.
Flax:	1 Tonne = 1.43 m^3 = 39.4 bu.
Canola:	1 Tonne = 1.60 m^3 = 44.1 bu.
Barley:	1 Tonne = 1.67 m^3 = 45.9 bu.
Oats:	1 Tonne = 2.35 m^3 = 64.8 bu.

Welded Wire Fabric

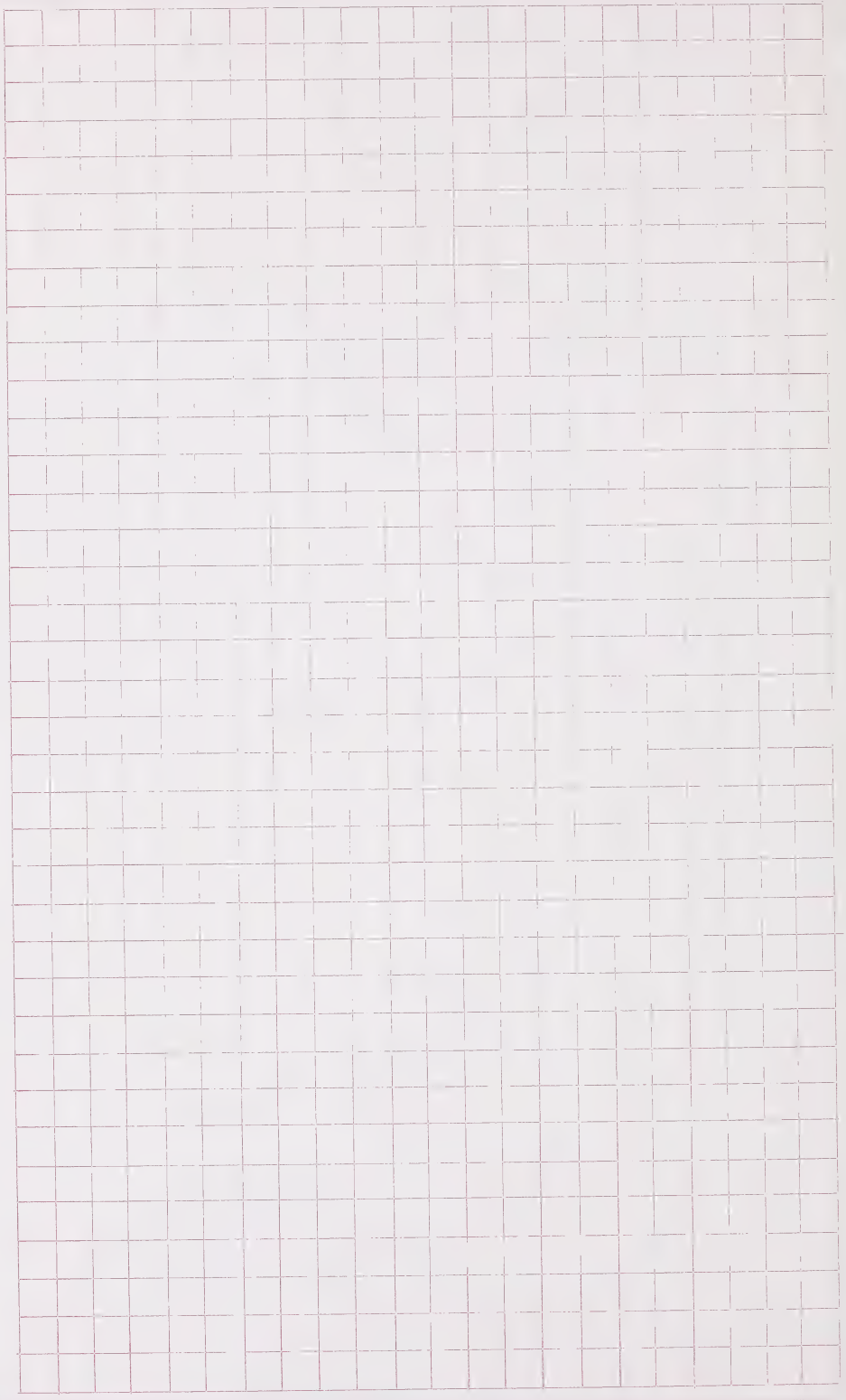
Spacings		Wire Size	
IMPERIAL	METRIC	IMPERIAL	METRIC
2"	50 mm	6	P18
3"	75 mm	8	P13
4"	100 mm	10	P9
6"	150 mm		
8"	200 mm		
12"	300 mm		

eg. 6 x 6 x 6/6 = 150 x 150 x P18/P18

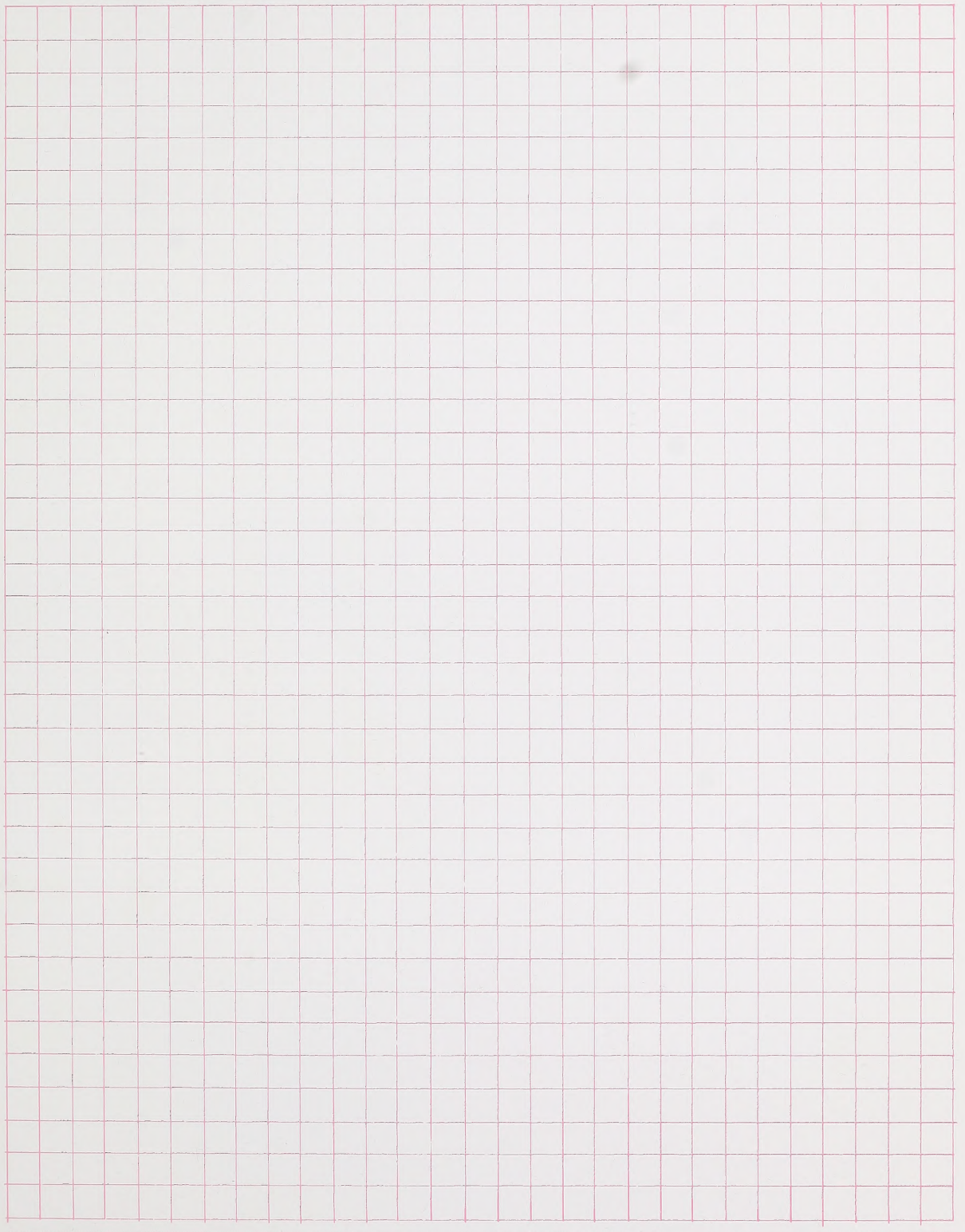
APPENDIX E

... LAYOUT WORKSHEETS

LAYOUT WORKSHEETS



LAYOUT WORKSHEETS



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